NATIONAL HEALTH PROGRAMS OF INDIA

National Policies & Legislations Related to Health

12th Edition

J. Kishore
MBBS (MAMC), MD (Com. Medicine, AIIMS)
PGCH&FWM, PGDEE, MSc (Sustainable Development)
MSc. (Mental Health), PhD (Psychiatry)
FNAMS, FIMSA, FIMAAMS, FIPHA, FIAPSM

Century Publications
New Delhi

ISBN: 978-81-88132-64-5

© Dr. J Kishore
All Rights reserved.
No part of this book may be reporduced by any means,
nor transmitted, nor translated into machine language
without the written permission of the publisher.

First Edition	:	1997
Second Edition	:	1999
Reprint	:	2000
Third Edition	:	2001
Fourth Edition	:	2002
Fifth Edition	:	2005
Sixth Edition	:	2006
Seventh Edition	:	2007
Eighth Edition	:	2009
Eighth (Reprint)	:	2010
Ninth Edition	:	2011
Tenth Edition	:	2012
Eleventh Edition	:	2014
Twelvelth Edition	:	2017

Price : ₹ 990

Published by:
Century Publications
46, Masih Garh (Jamia Nagar)
New Delhi - 110 025
Phone: 91-11-26936958, 09868010950
e-mail: centurypublications@hotmail.com
Website: http://www.centurypublications.co.in

Printed at: Sanjeev Offset, Delhi

Notice

Public Health is an ever-changing science. As new research and community based experience broaden our knowledge, changes in treatment and strategy for public action are required. I have checked with sources believed to be reliable official programs, policies and legislations. However, during preparation and summarization of contents of the document which should be suitable for students human error could be possible. The publication is being sold on the condition and understanding that information given herein is merely for guidance and reference. It must not be taken as having authority of, or binding in any way on, the author, publisher and sellers who do not owe any responsibility for any damage or loss to any person, who may or may not be a purchaser of this publication on account of any action taken on the basis of this publication. For authoritative text information, please contact the department concerned or refer to the government publication or the gazette notification.

Acknowledgement

I am extremely grateful to following experts for their valuable suggestions, criticism, and contribution during updating this book:

AC Dhariwal
Director, National Vector Borne Disease Control Program, DGHS, Min Health & Family Welfare, New Delhi

Anil K Gupta
Associate Professor, Head of Policy and Planning, National Institue of Disaster Management, New Delhi

Ajay Kumar Sood
Professor, National Institute of Health & Family Welfare, New Delhi

Anurag Agarwal
Adl Director, National Board of Examination, New Delhi

Arun Kumar D
Assist Professor, Community Medicine, Chennai Med Col, Hosp & Res Centre, Tiruchirappalli,Tamil Nadu

B Baburao
Assistant Professor Community Medicine
Osmania Medical College, Hyderabad

Bipin Batra
Executive Director, National Board of Examination, New Delhi

Brogen Akoijam
Professor, Community Medicine,
Regional Institute of Medical Science, Imphal

Charu
Senior Resident, Community Medicine, Maulana Azad Medical College, New Delhi

Das JK
Director, National Institute of Health & Family Welfare, New Delhi

Dinesh Kumar
Professor & Head, Community Medicine,
Govt Medical College, Jammu

Gaur DR
Senior Professor & Head, Community Medicine, Maharaja Agarsen Medical College, Agroha, Haryana

Gouri Kumari Padhy
Associate Professor Department of Community and Family Medicine, AIIMS Raipur

Grewal GS
Former President of IMA SDB
Lotus Clinic, Ashram, New Delhi

Ingle GK
Director Professor, Community Medicine,
Maulana Azad Medical College, New Delhi

Jahnavi G
Professor & Head, Andoman Nicobar Inst Med Sc, AN Island, Portbrair, India

Jagadish A Cacodcar
Associate Professor & HoD
Department of PSM, Goa Medical College, Goa

Jiloha RC
Professor & Head, Psychiatry, Hardard Institute of Medical Science Research, New Delhi

Kalika Gupta
Resident, Community Medicine, Maulana Azad Medical College, New Delhi

Libu GK
Associate Professor, Community Medicine,
Govt Medical College, Trivandrum, Kerala

Madhur Verma
Senior Resident Community Medicine & School of Public Health, PGI Chandigarh

Manju Toppo
Associate Professor, Community Medicine,
Gandhi Medical College, Bhopal,

Manish Goel
Associate Professor, Community Medicine,
LHMC, New Delhi

Meena Kakeri
Professor & Head, Community Medicine
Grant Medical College, Byculla, Mumbai

Mudassir Azeez Khan
Professor & Head Community medicine, Mysore Medical College & Research Institute, Myrore

Najam Khalique
Professor & Head, Community Medicine
JN Medical College, AMU, Aligarh, Uttar Pradesh

Neeru Gupta
Scientist, Division Reproductive Biology & Maternal Health, ICMR, New Delhi

Neeta Kumar
Scientist, Division Innovation & Translational Research, Child Health, ICMR, New Delhi

Pal DK
Professor & Head, Community Medicine
Gandhi Medical College Bhopal, Madhya Pradesh

Pratap Kumar Jena
Adj Assist Professor Pulic Health at KIIT school of public health, Bubneshwar, Odisha

Rajoura OP
Associate Professor, Community Medicine,
University College of Medical Sciences, Delhi

Ramba Pathak
Professor & Head Community Medicine, Hardard Institute of Medical Science Research, New Delhi

Ramakrishna Gaud
Associate Professor, Community Health,
St. John Medical College, Bangalore

Rauf -ur Rashid Kaul
Addl Professor, Community Medicine,
Shere Kashmir Institute of Medical Sciences, Srinagar, J&K

Raut DK
Director
Reagional Institute of H & FW, Mumbai

Ravi Kumar J
Professor Department of Community Medicine,
P. Siddharth Medical College, Vijayavada

Ruchika Kuba
Professor, School of Health Science,
IGNOU, New Delhi

Sameer Kumar Ray
Associate Professor, Community Medicine,
NRS Medical College, West Bangal

Sanjay Gupta
Professor, National Institute of Health & Family Welfare
New Delhi

Saudan Singh
Vice Chancellor, of the Hemwati Nandan Bahuguna Uttarakhand Medical Education University, Dehradun

Ravneet Kaur
Assistant Professor, Center for Community Medicine,
AIIMS, New Delhi

Seema Rani
Assistant Professor, Community Nursing
Rufaida College of Nursing, Jamia Hamdard, New Delhi

Siddharth
Head, Urban Health Resource Center,
New Delhi

Shazia Wafai
Regional Director Health & Family Welfare,
J& K

Sneha Kumar
Senior Resident, Community Medicine, Vardhman Mahavir Medical College & SJH New Delhi

Sufoora Bilqees
Professor &Head, Community Medicine,
Solan,

Tanu Anand
Assistant Professor Community Medicine, NDMC Medical College & Hindu Rao Hospital New Delhi

TK Jena
Professor, School of Health Science,
IGNOU, New Delhi

Uday Shankar Singh
Professor & Head, Community Medicine
P.S. Medical College, Karamsad, Anand , Gujarat

Urmila Bhardwaj
Associate Professor Community Nursing
Rufaida College of Nursing, Jamia Hamdard, New Delhi

Preface to Twelvelth Edition

There has been more than 15 years of this book which has emerged out an introduction to basic concepts of public health, national health planning, programming and legislation and to the approach to public health problems in India and neighboring countries. The eleventh edition of this book retains the organization and structure of the original, which consisted of three sections-Programs, Policies and Legislations. Section-I covers many concepts and principles of public health beside dealing with national programs. Section II elaborates important health related policies and Section III deals with legislations. This new edition is thoroughly updated and new chapters are further strengthened. One can find details on various aspect of government mission, programs, schemes and acts. The 12th Five Year Plan, National Health Mission and RMNCH A Plus Strategy, NITI Aayog and many initiatives of government are also incorporated for readers so that they can update themselves on the future health planning in the country. I am ever grateful to all my readers for their overwhelming support through their readership and critical suggestions. I would like to emphasize once again that this book is not an alternative to the documents produced by the Ministries and other departments of the government on various schemes, projects, programs, policies and legislations; rather it is essential and relevant information which should be understood by public health professionals, planners, managers. I always expect from my public health professional colleague to continue to provide me enough innovations, health actions and dedication so that one day, with collective efforts, India will emerge as the healthiest nation on this Earth and will provide direction to other countries.

I am grateful to all professionals, experts, and officials in various ministries particularly, Health & Family Welfare, Labor, Environment and Forest, Human Resource Development, Law, Social Justice and Empowerment, institutions and their websites for providing me information on respective policies, programs, and schemes. Truly speaking many time it is difficult to manage the contradictory figures provided by differnt sources. Still, I have scanned number of journals on public health to get the relevant information on numerous health indicators that helps me to evaluate various programs and policies. Discussion with esteem contributors and reviewers helped me to consolidate various issues which need to be presented in this book therefore many places you may find no reference for the statement. I would like to thank all contributors and reviewers for this.

It would be incomplete if I am not mentioning the special contribution of my son Cynthal J Kishore in every step of development of this book for sparing me for many things and challenging me to the new task.

September 2016 Dr. J Kishore

Preface to First Edition

There is a significant improvement in health and its provision to the people of India which has been possible because of vigorous implementation of different national programs. The priority areas of health delivery has been identified from time to time and through the five years plans and other policy decisions of the government and many changes have been made in objectives, strategies, implementation, name and structures of national programs. Our undergraduates medical and nursing students need to understand all national health programs not only to secure very good marks in their examinations but also to deliver health care to the people in hospitals or primary health centers according to public health priority and giving more emphasis to primary health care. This book is the outcome of long standing demand from the students of medicine, nursing, sociology, and those who are preparing their civil services and other career oriented examinations. It is important to note that this book is not an alternative to the documents produced by the health and other ministries on different programs rather than essential and relevant information needed to students for their examinations. I am extremely grateful to all personnel of the Ministry of Health and Family welfare for providing me information on respective national programs run by them. To make this book more useful and successful readers are requested to send their valuable suggestions.

October 1997, Dr. J Kishore, MD.

Contents

Part I: NATIONAL HEALTH PROGRAMS

1. Concepts and Principles of public health program 1
   - Risk and safety communication 2
   - Challenges of Public Health 3
   - Investment in Health 6
   - Primary Health Care 6
   - Vertical Programming 10
   - Millennium Development Goals 11
   - Sustainable Development Goals 13
   - The Kolkata Declaration on Public Health 15
   - The People's Charter For Health 15
   - The Mumbai Declaration 16
   - Data Sources for Demographic & Health Statistics 16
   - Census 16
   - Civil Registration System 19
   - Sample Registration System 19
   - Sample Surveys 21
   - Health Indicators 24
   - DALY 24
   - Health Status of India 25
   - Health Vision 2020 30
   - Health for All 30
   - Health Action at the National Level 31
   - Health Insurance 34
   - Social Intervention (Kerala Model) 37
   - Comparative Health Indicators of selected Countries 43
2. National Family Health Survey III & IV 44
3. Planning of Public Health in India 52
   - Planning in Modern India, Various committees 52
   - Planning 56
   - Planning Process 56
   - Planning Machinery of India 58
   - NITI Aayog 59
4. Five Year Plans 63
   - History of Five Year Plans 63
   - Bharat Nirman 72
   - Twelveth Plan 72
   - Swachh Bharat Abhiyan/Mission 79
5. Health Care Delivery System in India 82
   - Component of Health Service System 82
   - Public Health Care System of selected countries 83
   - Healthcare Providers in India 84

- Public Health System in India 84
- Urban Areas 85
- Rural Areas 86
- Success of Public Health Service (Tamil Nadu Model) 90
- Health Sector Reforms of Public Sector 94
- Private Health Sector 95
- Health Services in Delhi 96
- Pradhan Mantri Swasthya Suraksha Yojana 97
- Rashtriya Swasthya Bima Yojana 99
- Public Private Partnership in Health 100
- Accreditation of the Health System: JCI, NABH 107

6. National Health Mission 111
- National Rural Health Mission 117
- ASHA 120
- Indian Public Health Standards 127
- National Health Account 132
- Janani Suraksha Yojana 134

7. National Urban Health Mission 147
- Mamta Scheme 155

8. Reproductive, Maternal, Neonatal and Child Health Plus Adolescent Program 158
- Evolution of family planning 158
- Reproductive Health 160
- RMNCH +A Strategy 162
- Adolescent Health 164
- Sanitary Napkin Program 171
- Pregnancy and Child Birth 172
- Janani Shishu Suraksha Karyakram 173
- Navjaat Shishu Suraksha Karyakram 173
- Newborn and Child Health 175
- Integrated Management of Neonatal and Childhood Illness (IMNI) 181
- Diarrheal Diseases 184
- Diarrheal Control Program & ORS Program 186
- Acute Respiratory Infection 189
- Breastfeeding 190
- Baby Friendly Hospital Initiative 190
- Prevention and Control of Anemia 192
- Prevention and Control of Vitamin A Deficiency among Children 192
- Deworming Program 192
- Universal Immunization Program (UIP) 193
- Pentavalent Vaccine 200
- Cold Chain System 201
- National Immunization Schedule 201
- Mission Indradhanush 205
- Polio Eradication Program 205
- Reproductive Health 214
- Contraceptives 214
- Urban Health 228
- Tribal Health 230
- Mainstreaming Gender and Equity in RCH 234
- Health Equity 237
- Behavior Change Communication (BCC) 241

- Public Private Partnerships (PPP) 243
- Mother Friendly Childbirth Initiative 254

9. Revised National Tuberculosis Control Program (RNTCP): DOTS strategy 260
   - Components of DOTS 270
   - Pediatrics Tuberculosis 279
   - Multi-Drug Resistant (MDR) Tuberculosis 281
   - Extensive Drug Resistance XDR TB 283
   - DOTS Plus 284
   - Chemoprophylaxis 292
   - BCG (Bacille Calmette-Guerin) 293
   - International Standard for TB Care 295
   - The End TB Strategy (2016-2030) 297
10. National AIDS Control Program 311
   - Attributable Factors of the HIV spread 314
   - National AIDS Control Program IV 319
   - Sexual Transmitted Diseases Control Program 324
   - Syndromic Approach 326
   - Voluntary Counseling and Testing 328
   - Integrated Conseling and Testing Center (ICTC) 330
   - PPTCT Program 334
   - Universal Precautions & Post Exposure Prophylaxsis 335
   - Safe Blood Program 336
   - Condom Program 339
   - Care, Support and Treatment 341
   - Anti-Retroviral Therapy 341
   - HIV / TB Coordination 347
   - Strategic Information Management System 349
   - Surveillance 350
   - IEC and Social Mobilization 354
   - AIDS Vaccine 357
11. National Vector Borne Disease Control Program 367

11A. Malaria 370
   - National Framework for Malaria Elimination in India (2016-2030) 379
   - Urban Malaria Scheme 383
   - Malaria Surveillance 385
   - National Drug Policy for Malaria 2013 387
   - Insecticide Policy 396
   - Insecticide Treated Bed nets Program 400
   - Malaria Epidemic: Prediction, Preparedness and Control 402
   - WHO Global Malaria Control Strategy 408
   - Malaria Vaccine 409

11B. Kala-Azar 411

11C. Lymphatic Filariasis 415

11D. Japanese Encephalitis 419

11E. Dengue 421

11F. Chikungunya Fever 431

11G NIPAH 434

11H. Leptospirosis 436

12. Yaws Eradication Program 440

13. National Leprosy Eradication Program 443
   - Epidemiology, Clinical features 443

- Prevention and Control 448
- NLEP 448
- Leprosy Vaccine 457
- Women and Laprosy 457
- "Final" Push Strategy for Leprosy Elimination Program 461

14. Guinea Worm Eradication Program 462
15. Rabies Control Program 464
16. Integrated Disease Surveillance Project (IDSP) 471
17. National Program for Control & Treatment of Occupational Diseases 480
    - Global Strategy for Occupational Health 484
18. Nutritional Programs 486

18A. Integrated Child Development Service (ICDS) Scheme 495
- Scheme for Adolescent Girls (Kishori Shakti Yojna) 497
- The Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (Sabla) 498
- Anganwadi 499

18B. Mid-Day Meal Program 503
18C. National Nutritional Anemia Prophylaxis Program 506
12 By 12 Initiative for Anemia Control 507
National Iron Plus Initiative 508
18D. National Program for Prophylaxis against Blindness in Children caused due to Vitamin A Deficiency 509
Pilot Project against Micronutrient Malnutrition 512
18E. World Food Program 515

19. National Program for Control of Blindness (NPCB) 518
- District Blindness Control Society (DBCS) 523
- Vision 2020 525
- Towards universal eye health: A global Action Plan 526

20. National Iodine Deficiency Disorders Control Program 529
21. National Mental Health Program 539
- District Mental Health Program 545
- School Mental Health Program 548
- Drug De-addiction Program 552
- Alcoholism 552
- Substance Dependence 555

22. National Program for Prevention and Control of Cancer, Diabetes, CVD and Stroke 562
- National Cancer Control Program 569
- Cancer Vaccine 573
- Diabetes 575
- Cardiovascular Diseases 578
- Program for NCD 583

23. National Anti-Tobacco Program 591
- Tobacco Free Initiatives 595

24. National Oral Health Program 599
25. National Organ Transplant Program 603
26. National Program of Health Care for the Elderly 605
27. National Program for Prevention and Control of Deafness 612
28. Essential Medicines and Program of Rational use of Drugs 616
29. Pharmacovigilance Program of India 618
30. Programs and Schemes for Disabled Persons 620
    - Schemes of Integrated Education for the disabled children 621

- District Rehabilitation Center 622
- National Program for Rehabilitation of Persons with Disabilities 623

31. National Program for Prevention of Burn Injuries 626
32. National Trauma System in India 630
33. National Emergency Preparedness Plan: Disaster Management 633
    - Emergency Medical Relief (EMR) 640
    - Hospital Disaster Action Plan 641
    - Management Plan for Flood Affected Areas, An Example 642
    - Bioterrorism 643
    - Anthrax 645
    - Severe Acute Respiratory Syndrome (SARS) 646
    - Human Influenza H1 N1 (Swine Flu) 647
    - Avian Influenza (Bird Flu) 456
    - Ebola Virus Disease 656
    - Zika Virus Disease 657
34. School Health Services 661
    - School Health Program in India 666
35. National Program for Prevention and Control of Fluorosis 671
36. Basic Minimum Service Program 673
37. India Population Projects (IPP) 677
38. Poverty Alleviation Programs 679
39. Programs for Water and Sanitation 685
    - Arsenic and other metals problem in India 687
    - National Rural Drinking Water Program 688
    - WHO Water Quality and Health Strategy 694
    - National Slum Development Program 695
    - Swachh Bharat Mission 695
40. National Biomass Cookstoves Program 698
41. Evaluation of a National Health Program 701
    - Types of Evaluation 702

PART II: NATIONAL POLICY RELATED TO HEALTH

42. National Policy Related to Health 709
43. National Health Policy 2002 712
    - Health / Medical Tourism 724
    - Telemedicine 726
    - National Health Policy 2015 (Draft) 728
44. National Population Policy 2000 737
    - Jansankhaya Sthirtha Kosh 743
45. National AIDS Prevention and Control Policy 747
46. National Vaccine Policy 754
47. National Blood Policy 762
48. National Policy for the Empowerment of Women 2001 765
49. National Charter for Children 2003 771
50. National Youth Policy 1998 776
51. National Policy for Older Persons 1999 779
52. National Policy for Persons with Disabilities 781
53. National Nutrition Policy 785
54. National Health Research Policy 788
55. Pharmaceutical Policy 794

56. National Policy on Indian System of Medicine and Homeopathy 2002 796
57. National Policy on Education 798
58. National Water Policy 2002 801
59. National Environment Policy 2006 805
60. National Conservation Strategy & Policy Statement on Environment & Development 1992 812
61. National Housing and Habitat Policy 1998 814
62. National Rehabilitation and Resettlement Policy 2007 816

PART III: LEGISLATION, NATIONAL AND INTERNATIONAL HEALTH ORGANIZATION

63. Legislation Related to Health 821
- National Legal Literacy Mission 824

64 National Health Bill 2009 825
65. Legislation related to Quality of Professional Education and Services 832
- The Indian Medical Council (Professional Conduct and Ethics) Act 1956 and Regulations 2002 834
- The Indian Nursing Council Act 1947 837
- The Dentists Act 1948 838

The Pharmacy Act, 1948 839
The Rehabilitation Council of India Act, 1992 839

- The Indian Medicine Central Council Act, 1970, 84/95 840
- The Homeopathy Central Council Act, 1973 841
- The Indian Medicine and Homeopathy Council Bill 2005 942
- The Delhi Nursing Homes Registration Act 1953 843
- The Clincal Establishment (Registration and Regulation) Act, 2010 843
- The Consumer Protection Act (CPA) 1986 845
- The Patents Act 1950 847
- The Copyrights Act 1957 848

66. Legislation Related to Census, Birth and Death 849
- The Census of India 2001 849
- The Registration of Births and Deaths Act 1969 852

67. Legislation Related to Control of Epidemics 854
- The Epidemic Disease Act 1897 854
- The Maharashtra Prevention of the Infection and Spread of Epidemic Disease (Plague) Regulation 1994 854
- Indian Air Craft (Public Health) Rules 1954 855

68. Legislation related to Tobacco and Drug Control 856
- The Cigarettes and Other Tobacco Products (Prohibition of Trade and Commerce, Production, Supply and Distribution) Act 2003 856
- The Narcotic Drugs and Psychotropic Substances Act 1985 857
- The Drugs and Cosmetics Act 1940 859
- The Drugs and Magic Remedies (Objectionable Advertisements) Act 1955 861

69. Legislation related to Other Public Health Problems 863
- The Transplantation of Human Organs Act 1994 863
- Food Adulteration 867
- Food Safety and Standards Act 2006 867
- The Protection of Human Rights Act 1993 873

70. Legislation for Women Empowerment and Health 874
- The Medical Termination of Pregnancy (MTP) Act 1971 and the MTP Rules and Regulations 2003 875

- The Maternity Benefit Act 1961 877
- The Family Court Act 1984 877
- The Dowry Prohibition Act 1961 878
- The Commission of Sati (Prevention) Act 1987 879
- The Immoral Traffic (Prevention) Act 1956 880
- Violence Against Women 881
- The Protection of Women From Domestic Violence Act 2005 882

71. Legislation for Child Protection and Health 885
- The Pre-Conception and Pre-Natal Diagnostic Techniques (Prohibition of Sex Selection) Act 1994 886
- The Infant Milk Substitutes, Feeding Bottles and Infant Food (Regulation of Production, supply and Distribution) Act 1992 892
- The Juvenile Justice (Care and Protection of Children) Act 2000 893
- The Child Labor (Prohibition and Regulation) Act 1986 894
- The Prohibition of Child Marriage Act 2006 896
- Protection of Children from Sexual Offences Act 2012 897
- The Right to Education Act 2008 898

72. Legislation for the Older Persons 900
- Maintenance and Welfare of Parents and Senior Citizens Act 2007 900

73. Legislation related to the Welfare Rehabilitation of Disadvantaged 903
- The Persons with Disabilities (Equal Opportunity, Protection of Rights and Full Participation) Act 1995 903
- The National Trust for Welfare of Persons with Autism, Cerebral palsy, Mental retardation and Multiple Disabilities Act 1999 and Rules 2000 905
- Mental Health Act 1987 906
- National Rural Employment Guarantee Act 2005 909
- The Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act 1989 910
- Welfare of Scavengers 911
- The Employment of Manual Scavengers and Construction of Dru Latrine (Prohibition) Act 911

74. Legislation Related to Occupational Health 913
- Legislation for Female Workers 914
- The Factories Act 1948 915
- The Mines Act 1952 916
- The Emplpyees States Insurance Act 1948 & Regulations 1950 917
- The Workmen's Compensation Act 1923 922
- The Minimum Wages Act 1948 922
- Contract Labor (Regulation and Abolition) Act 925
- Contract Labor (Regulation & Abolition) Central Rules 1971; Construction and Maintenance of Creches 926
- The Plantation Labor Act 1951 926
- The Unorganized Sectors Workers's Social Security Act 926
- The Bonded Labor System (abolition) Act 1976 927
- The Trade Union Act 1926 928
- The Dangerous Machine (Regulation) Act 1983 928

75. Environment Health Legilations 930
- The Environment (Protection) Act 1986 935
- Biomedical Waste Management Rules 2015 936
- Municipal Solid Waste (Management & Handling) Rules 2000 942
- Hazardous Waste (Management & Handling) Rules 1989 943

- Chemical Accidents (Emergency Planning, Preparedness and response) Rules 1996 944
- Public Liability Insurance Act 1991 944
- The National Environment Tribunal Act 1995 945
- Air Pollution 946
- Air (Prevention and Control of Pollution) Act 1981 949
- Water (Prevention and Control of Pollution) Act 1974 950
- The Atomic Energy Act 1962 and Safety Related Rules 952
- The Insecticides Act 1962; The Insecticides Rules 1993 952
- Plastic Waste (Management and Handling) Rules 2011 953
- E Waste Management Rules 2015 954
- Delhi Municipal Corporation Act 1957 955
- The Motor Vehicles Act 1988 956
- The Noise Pollution (Regulation and Control) Rules 2000 956

76. The Disaster Management Act 2005 958
77. The Red Cross Society (Allocation of Property) Act 1936 960
78. International Health Regulation 961
79. National and International Health Organizations 963
    - WHO
    - Unicef
    - FAO
    - World Trade Organization
    - Work Bank
    - ILO
    - UNHCR
    - DFID
    - NORAD
    - CIDA
    - DANIDA
    - JICA
    - CARE
- Important Days of National & International Health 986
- Abbreviations 988
- Index 993

Part -I

National Health Programs

CHAPTER 1

CONCEPTS AND PRINCIPLES OF NATIONAL HEALTH PROGRAMS

INTRODUCTION

Over the decades the public health is able to delivery best of its capacity to bring change in various health indicators (Koppaka R 2011). Following achievements are noteworthy:

1) Reduction in child mortality;
2) Reduction in vaccine preventable diseases;
3) Access to safe water and sanitation;
4) Malaria prevention and control;
5) Prevention and Control of HIV/AIDS;
6) TB control;
7) Control of Neglected tropical diseases;
8) Tobacco control;
9) Global Road safety and Awareness;
10) Improved preparadness and response to global health threats;
11) Increase in life expectancy; and
12) Decrease in substance abuse and addiction.

There are many more achievements in the field of public health but still far from satisfaction particularly in developing countries and remote areas. To make further dent on the disease burden and improving quality of life, public health experts must understand basic concepts of health and disease, estimation of burden, interpretation of health situation, making community diagnosis, planning, designing on the basis of scientific facts, implementation and evaluations of various preventive and control measures.

In many countries the focus of public health is changing to healthy and prolong living of quality life. Therefore, more and more investiment is made in health promotion program. However, in developing countries struggle is continued against the communicable and non-communicable diseases.

To understand the burden of disease, we should be very clear about various terms such as disease, illness, sickness, disability, handicapped, etc. ***Disease*** is a condition of the body or some part or organ of the body in which its functions are disrupted or deranged; in simple terms it is the physiological or psychological dysfunction. ***Illness*** is a subjective state of the person who feels aware of not being well and ***sickness*** is a state of social dysfunction, i.e., a role that the individual assumes when ill. ***Handicap*** is a social disadvantage or loss of role associated with sick individual, resulting from the impairment, or disability, that limits or prevents the fulfillment of a role that is normal (depending on age, sex, and social or cultural factors) for that individual. It is quite difficult to assess the illness and sickness, however, disease can be measured directly or indirectly in terms of clinical state, disability, and death. No individual or community desires to have the disease. The prevention of diseases is a major goal of public health programs.

The WHO has defined **health** but not disease because the disease has many shades (spectrum of disease) ranging from unapparent cases to severe manifested illness leading to recovery or disability or death. Defining health is giving positive side of the existence. A group of people in society must have optimal harmony with their environment. This can be approached in three ways:

a) by methods to improve host resistance of populations to environmental hazards;
b) by effective plans to improve the safety of the environment; and
c) by improving health care systems designed to increase the likelihood, efficiency, and effectiveness of the first two goals.

To start with public health, we must have baseline statistics about the community. First of all, we all want to know how healthy a given community is. We always compare the status of one community or country with other. The information on health status is required when some interventions are planned, and then to evaluate whether the intervention succeeded or not. Therefore, knowing about the level of health of a community is a useful tool to decide what kind of intervention for a disease or a health problem is required and what changes are needed for the future intervention.

Risk and safety Communication

You will be surprised to know that some health issues come to attract attention from leaders of international organizations and national political systems, while others are neglected. Many global health analysts present evidence that material factors such as mortality and morbidity burden and the availability of cost-effective interventions may not explain the variance in the levels of attention health issues receive (Reich 1995, Lopez 2006, Sridhar 2008, Reichenbach 2002). For instance, in the early 2000s HIV/AIDS received more than one-third of all major donor funding for health (Shiffman 2008), despite representing only around 5% of the mortality and morbidity burden in low- and middle-income countries (Lopez 2006). Risk and safety are not objective conditions 'out there' simply waiting to be perceived by citizens or calculated by professional risk analysts (Stallings 1990). The 'data'do not interpret themselves". Rather, human beings process information selectively, constructing some phenomena as risky and others as safe. Similarly, issues do not designate themselves as "important". Rather, human beings engage in "strategic social construction", advancing claims concerning what does and does not deserve to become a public problem (Hilgartner 1988, Khagram et al 2002). Some of these claims are pushed forcefully and effectively, and attracting public resources. Other claims never even make it to the table.

Materialists or physical scientists believe that the world consists largely of hard material facts. By contrast, social constructionists or social scientists believe that the world consists largely of ideas. Our socially shared interpretations mediate and form our perceptions of reality (Searle 1995).

Many global health issues are backed up by powerful institutions and understood in the organizational sense of the term. For instance, for several decades the Task Force for Child Survival and Development has coordinated global efforts to ensure political attention for the health of children (Task Force for Child Survival and Development 2009). The Global Polio Eradication Initiative, linking the World Health Organization, Rotary International, the Centers for Disease Control and the United Nations Children's Fund (UNICEF), spearheads a global initiative to eradicate polio (Global Polio Eradication Initiative 2009). HIV/AIDS is supported by a massive global architecture including: its own United Nations agency -UNAIDS; the US President's Emergency Plan for AIDS Relief (PEPFAR) described as the largest commitment ever by any nation for an international health initiative dedicated to a single disease (US President's Emergency Plan for AIDS Relief 2009); its own global financing source - the Global Fund to Fight AIDS,Tuberculosis and Malaria; and hundreds of civil society organizations.

The creation of strong global institutional arrangements with the capacity to create and negotiate issue portrayals is critical to an issue's sustainability prospects on the global health agenda. Where policy communities have struggled to create effective institutions, such as for malnutrition (Morris 2008) and pneumonia (Unicef & WHO 2006), political attention will be minimal until such structures are put in place. So public health issues are more than just scientific facts and a public health expert must udnerstand these

multifactorial causation of raising some issue as a public health challenge.

CHALLENGES FOR PUBLIC HEALTH

Public Health is facing challenges in following areas:

1. Poverty
2. Inequity
3. Public Demands
4. Marginalizing Public Health Services
5. Public Health Delivery
6. Epidemiological Transition
7. Climatic Change and Environmental Health
8. New Psychosocial Issues
9. Rapid Population Growth

Poverty

Poverty is the biggest epidemic that the global public health community faces. It underlies most cases of under-nutrition, fuels the spread of many diseases and deepens vulnerability to the effect of illness and trauma. Poor countries are unable to give their health and social services adequate resources, resulting in a poverty of health systems that compounds poverty at the household and community levels.

According the official statistics of the World Bank, the number of very poor people has increased by 10.4 percent between 1987 and 2001 to 2735 million-almost half of the world's population (Chen & Ravallion 2004). Furthermore, there is reason to believe that the World Bank's methodology for measuring poverty is flawed and underestimates the true breadth and depth of poverty worldwide (Reddy and Pogge 2006). In 2004-05, the total Population Below Poverty Line= 37.2% (Based on Tendulkar Committee reports. Urban= 33.33 Rs per day/ 1000 Rs per month. Rural= 27 Rs per day/ 816 Per month). Rural poverty= 41.8% and Urban Poverty=25.7%.

In 2012, the total Population Below Poverty Line = 21.9% (Based on Tendulkar Committee reports. Urban= Rs. 33.33 per day/ Rs. 1000 per month. Rural= Rs. 27 per day/ 816 Per month). Rural Poverty= 25.7% and Urban Poverty=13.7%.

Inequity

Equity is a value of maintaining fairness in receiving a reward in proportion to one' contribution. It is fairness or justice. Equity issues arise at many levels of the health care system. For example, a national ministry of health may be concerned with the fair allocation of budget rupee across regional health districts, as well as with an equitable distribution of professionals throughout the country. The regional health districts may be concerned with the fair allocation of primary and secondary health services between urban and rural populations, or among other groups such as women and children, the elderly, or the poor.

Increasing levels of poverty have been accompanied by growing inequality. The income gap between the fifth of the world's people living in the richest countries and the fifth of the poorest was 74 to 1 in 1997, up from 60 to 1 in 1990, 30 to 1 in 1960, and 11 to 1 in 1913.

The assets of the top three billionaires are worth more than the combined GNP (Gross National Product) of all least developed countries and their 600 million people (UNDP 1999). International trade rules and regulations are stacked in favor of richer countries and multinational corporations; debt cancellation is given at the whim of rich nation creditors rather than as a response to the pressing needs of citizens of poorer countries. The conditionalities imposed upon poor governments by the World Bank and International Monetary Fund (IMF) are undemocratic and have included the privatization of public assets, thereby safety nets. More and more private bodies are involving in health care to make profit that leads to increase in cost.

Public Demands

Public demand for health services is increasing in majority of regions but there is very little demand in most vulnerable section of society. Increasing demand for health services also increases the accountability and responsibility to community. Health services should be distributed with equity and preserve the human rights. Public demand is also increasing due to increase in population. This is an important concern because the world *population* has increased three fold in last century whereas India has increased almost five times in the same duration. The number of persons living in urban areas increased globally from 32% of world population in 1955 to 38% in 1975, and to 45% in 1995. It is expected to reach 54% by 2015 (World Health

Report 1998). In India the urban population during 1911-1931 was 11-12% only, in 1951 17.3% and it reached to 25.7% in 1991, 30% in 2001 and it is 35%-38% in 2010 onward.

Marginalizing Public Health Services

Constitutionally, public health and sanitation in India are primarily the responsibility of the states. However, the central health ministry has a major influence on the states' public health policies because of its fiscal leverage, convening power, technical resources, and ability to draw and disseminate lessons across states. But for a long period the central government's policies have neglected public health services (Das Gupta et al 2009). Separation of public health engineering services from the health departments was also jeopardized the impact of public health services. Implementing multi-purpose workers scheme where all male sanitary inspectors converted into MPWs who had to work for small pox, malaria or any other priority program could also be the example of mirginalizing their roles in comprehensive public health services.

In recent times health workers male are not appointed and most of the work is enthrusted to ASHAs focusing on RCH. Once again public health issues such as water, sanitation, nutrition, transport, are neglected.

Public Health Delivery

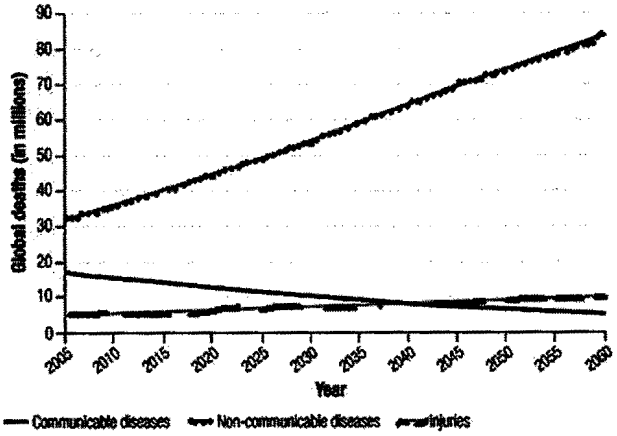
The major concerns in public health delivery are equality, secularism, freedom, justice and dignity of the individual. Health services should be of quality which demands compulsory continuing of medical education, medical audit, etc. The teaching of ethics as a formal part of the curriculum is largely absent and needs to be addressed. Delivery system is facing challenges in the following areas:

1. Health sector reform / NGO, public-private partnership,
2. Issues of decentralization of health care,
3. Appropriate use of health information technology,
4. Quality assurance,
5. Ethical issues and public health laws,
6. Cost effective intervention and health economics,
7. Dealing with limited resources / mobilizing resources,
8. Standardization and accreditation of public health,
9. Medical education and services.
10. Outreach and Referral Services through:
    - Strengthen task-shifting and outreach to ensure judicious utilization of the services of medical officers
    - Provide two outreach workers per sub-centre where at least one is a female
    - Encourage outreach workers with incentives
    - Promote Home-based Outreach rather than Centre-based Approach
    - Strengthen referral system from the primary to secondary and secondary to tertiary levels.
    - Monitor the effectiveness and quality of referral system
    - Ensure round-the-clock services at Community Health Centers (CHC) with more specialist and duty Medical Officers
    - Establish specialty hospitals for every revenue division
    - Link Below Poverty Line (BPL) families to free services and insurance schemes
    - Promote Community Mobilization and Appreciative Enquiry techniques

Epidemiological Transition

Patterns of mortality are shifting from a high burden of infectious diseases to an increase in chronic degenerative diseases (cardiovascular diseases and cancers). Morbidity patterns are also showing a similar increase in non-fatal but disabling conditions (for example, osteoarthritis). This is known as epidemiological transition (Kishore 2013). As life expectancy increases, the major causes of death and disability also shift from communicable, maternal and perinatal causes to chronic noncommunicable diseases. Brain disorders—neurological, psychiatric, and

Figure 1.1: Global Deaths with major disease groups



developmental—now affect at least 250 million people in the developing world, and this number is expected to increase as more people live to old age. Most of the developing countries are following similar patterns of development as of the developed nations, and the disease patterns are also following accordingly.

Following issues in epidemiological transition are concerned to public health:

1. Emerging and reemerging diseases;
2. Rapid industrialization, environmental pollution and health impact assessment;
3. Globalization and international health;
4. Biological, nuclear and chemical weapon threats;
5. Genetically modified food and food pollution due to chemicals;
6. Rapid response to public health emergency and disasters; and
7. Smoking, road traffic accidents and injuries.

This epidemiological transition is mainly due to improved water supply, sewerage, and less crowded living environment, application of the preventive health services, such as immunization, preventive health checkups, specific food interventions and use of highly developed curative technology. However, some developing countries are experiencing the *triple burden* of diseases, i.e., one which is caused by communicable diseases, maternal & perinatal diseases, and second which is due to adopting lifestyles similar to the people of developed world leading to diabetes, cardiovascular diseases, etc., and the third is population, poverty, poor water supply and sanitation and low standard of livings.

Climatic Change and Environmental Health

Global warming leading to climatic change is a big challenge in front of public health. Continuous industrialization, urbanization, and changing life-style pressing energy consumption leading to global warming. Climatic change is already linked with human and environmental calamities such as flood, earth quakes, cyclones, rising sea level, etc. These changes are having impact on epidemiology of vector borne and other diseases. Pace of changes is faster than the control and preventive measures adopted by the countries pose greater challenge in front of public health (Nilsson et al 2012).

The World Health Organization (WHO), the World Meteorological Organization, and the United Nations Environmental Program have noted, with concern, the implications of climate change on human health. The United States Interagency Working Group on Climate Change and Health has identified at least eleven categories of climate change's impact on human health (Singh JA 2012), including:

- asthma and respiratory disease;
- cancer;
- cardiovascular disease and stroke;
- foodborne diseases and nutrition;
- human developmental effects;
- mental health and stress-related disorders;
- neurological diseases;
- vectorborne and zoonotic diseases;
- waterborne diseases;
- weather-related morbidity and mortality.

The Wildlife Conservation Society has identified 12 pathogens—dubbed the "deadly dozen"—that could spread into new regions and affect human health as a result of climate change:

- avian flu;
- tuberculosis;
- Ebola virus;
- cholera;
- babesiosis;
- parasites;
- Lyme disease;
- plague;
- Rift Valley fever;
- sleeping sickness;
- yellow fever;
- red tides (algal blooms).

New Psychosocial issues

Due to change in life styles, acculturation, globalization, industrialization, and social values, many issues have become a challenge such as:

1. Social pathology, e.g., substance abuse, violence, suicide.
2. Gender sensitive service: health services should be equitably distributed and should focus more towards female gender.
3. Behavioral changes – communication is advanced due to information technology and at the same time to preserve human culture, many of the health programs should be culture-specific.

4. Stress is increasing day by day which is associated in causation of all types of diseases.

Rapid Population Growth

Rapid population growth particularly in developing countries where resources are less and training facilities are limited is really a big challenge for public health.

INVESTMENT IN HEALTH

Good health contributes to development through a number of pathways:

- *Higher labor productivity:* Healthier workers are more productive, earn higher wages, and miss fewer days of work than those who are ill.
- *Higher rates of domestic and foreign investment:* Increased labor productivity in turn creates incentives for investment. In addition, controlling endemic and epidemic diseases, such as HIV/AIDS, is likely to encourage foreign investment.
- *Improved human capital:* Healthy children have better cognitive potential. As health improves, rates of absenteeism and early school dropouts fall, and children learn better, leading to growth in the human capital base.
- *Higher rates of national savings:* Healthy people have more resources to devote to savings, and people who live longer save for retirement. These savings in turn provide funds for capital investment.
- *Demographic changes:* improvements in both health and education contribute to lower rates of fertility and mortality.

Beside these reasons investment in health is also increasingly being recognized as an important means of economic development and achieving public health. It is also noticed that development improves public health. Therefore, investment in health should be adequate. However, how to increase this investment is a great challenge. On the basis of National Health Account 2001-02 the estimated health expenditure is 4.8% of the Gross Domestic Product (GDP) at current market price, while health expenditure as a percentage of the GDP measured at factor cost works out to 5.2%. Out of this, central, state, and local governments together spend one-fourth of the total health expenditure. The share of other central ministries, which include railways, defence, posts and telegraphs, other civil ministries, etc., is estimated to be about 2.42% of the total health spending by the ministries as well as reimbursements provided to its employees (Table 1.1).

Table 1.1: Sources of financing in the health (2004-05)

Source	*Percentage*
Household	71.13
State governments	11.97
Central government	6.78
Local governments	0.92
Social Insurance Fund	1.13
External funds	2.28
Private firms	5.73
NGOs	0.07

PRIMARY HEALTH CARE

Primary Health Care is an essential health care made accessible at a cost the country and community can afford, with methods and technology that are practical, scientifically sound and socially acceptable to individuals and families in the community through their full participation to maintain at every stage of their development in the spirit of self reliance and self-determination (WHO). During the last 25 years primary health care (PHC) has evolved and developed. Governments in most countries have accepted and adopted the philosophy and principles of PHC as the basis for investment in health and their strategy for reforming and developing their health service systems. In consequence, the principles of PHC have been translated into operational systems for its implementation.

As originally defined, PHC was implicitly a health development strategy as well as a level of health services. In most cases, it has been adopted and adapted by each country according to its own health and socioeconomic conditions. Within that context, many countries have understood PHC as "the primary level of care – the point of contact with the community and the population's gateway to the health system." This concept has tended to predominate in countries that have achieved adequate levels for basic health services. PHC is not a "limited package of interventions for poor people" but the basic strategy of health systems to ensure greater coverage and

equity. In many countries the concept of PHC was not realized fully and wide range of issues emerged out from it.

Parallel to this development, since WHO conference at Alma Ata, dramatic changes have occurred in the epidemiological profile of diseases, in demographic profiles and in socioeconomic environment that present massive new challenges to PHC. Many countries are reforming their health sectors and these reforms are based on PHC. Because of this, it is clear that PHC must be strengthened in all countries, and especially in developing countries.
Funding, organization, coverage, quality, effectiveness, performance, human resources, capacity building, social participation and accountability are all among the salient issues when services are developed and continuously improved to meet the challenges and responsibilities.

In the year immediately after Alma Ata, the District Health System (DHS) model was formulated as an organizational framework for a health care system to deliver the PHC Approach.

The demise of health for all

Health care systems require the availability of basic physical and human infrastructure throughout a country if they are to be effective and equitable, but many have resources to do so.

Low-and lower middle-income countries need to spend at least US$30-40 (2002 prices) each year per person if they are to provide their populations with 'essential' health care. There was hike in oil prices during 1979-1981 that lead to negative economic growth, reduced government revenue and increased poverty. Most health care systems have never had a chance to recover from these effects. There were economic crises in most of the countries. There was shortage of drugs and other supplies; a catastrophic loss of morale and motivation of public health workers as the value of their salaries plummeted and as expenditure constraints undermined their ability to work (Segall 2000).

Demoralization, cynicism and unethical behavior grew among public sector health works. This included treating patients uncaringly, levying 'under the counter' 'moonlighting' in the private sector and stealing drugs for private use (Bassett et al 1997) Public sector downsizing and resignations led to health workers migrating to the private sector, adding to the growing number of informal and unregulated drug vendors, 'pavement doctors' and other private practitioners. As public services deteriorated, households resorted increasingly to over the counter drug purchases and the use of private practitioners (Segall 2000) Informal health care practice significantly expanded independently, called privatization. International Monetary Fund (IMF) and the World Bank intervened in and shape the health sector of poorer countries through structural adjustment programs (Kishore 2013) and conditionalities attached to grants, loans and debt relief.

'Health sector reform' is the term used to describe a set of policies initially promoted by the World Bank and IMF, often through structural adjustments programs, from the mid 1980s onwards. These have included imposing tight and reduced fiscal limits on public health care expenditure; promoting direct cost-recovery (user fees) and community-based financing; and transferring or outsourcing functions to the private sector.

The World Trade Organization together with a number of bilateral and regional trade agreements have influenced the design of health care systems by reducing the capacity of governments to regulate health care markers, encouraging cross border 'trade' in health care, and facilitating of corporate heath businesses to operate more freely within health care systems of other countries (Hilary 2001, Shaffer et al 2005).

Newer Challenges

1. User Fees and the denial of access to essential health care: User charge is any payment made by the beneficiaries directly to the health care provider at the time of delivery of health care services. Proponent of user charges argues that this will increase efficiency, equity, quality and sustanability. User chargers are justified as a revenue generated to improve the financial sustainability for delivery of health care services. It influences consumer behavior and control demand for health care services, especially hospital services. User fee is necessary to improve

quality of health care services through availability of drugs and supplies.

Criticism: One effect of health sector reform was the promotion of greater privatization of health care financing, including out-of pocket payments for health care in the public sector (Akin, Birdsall and Ferranti 1987), partly to offset reduced levels of public expenditure. Such privatization added to the growth in user charges that arose from the 'passive privatization' of health care and the increase in informal, under-the-counter charges in the public sector.

The impact of this transfer of responsibility for health care financing onto households has been disastrous, particularly for the poor. It has deterred people from accessing health care and resulted in untreated sickness and avoidable death (Whitehead, Dahlgren and Evens 2001, Theodore 1999, World Bank 1999, Yu, Cao and Lucas 1997). User fees have also discouraged people from taking full doses of their medication; evidence is emerging that they undermine adherence to anti-retroviral treatment and increase the risk of drug resistance (WHO 2004).

User fees also generate poverty, or deepen the poverty of those who are already poor. Households may cut down on their food consumption, sell off precious assets such as land or cattle, or withdraw children from school to save on school fees (Whitehead, Dahlgren and Evans 2001, Tipping 2000). User fees are a major and widespread barrier to essential health care, as well as a cause of long-term impoverishment, it is paradoxical that the poorer a country, the likely its people will face out- of-pocket health care expenditure.

2. Segmentation of health care system: segmentation of health system is providing separate health care systems for richer and poor people, as opposed to one universal health care system for all. The World Bank in particular has advocated that governments in poorer countries should focus their scarce public resources on providing a free 'basic' or 'minimum' package of preventive and curative services for the poor, while withdrawing from the direct provision of other services. By encouraging the relatively rich sections of society to use the private sector, it argues that the public sector will be able to redirect its resources to those most in need (IFC 2002, Gwatkin 2003).

Tax breaks on private insurance are used to entice higher- income groups away from publicly provided services. Health care systems in some countries including India encouraging the private providers to cater to foreign 'medical tourists' from high-income countries or from high-income groups in low-and middle- income countries. But there is no evidence that such a system is more equitable or efficient. The greater likelihood is it would result in increased inequality as the middle-classes opt out of public sector provision. This public system rather taken as a 'poor service for poor people'.

Segmentation is therefore attractive to private investors on health care, especially where there is a large enough or rich enough upper-and middle-class market to sustain the development and financing of a private health sector.

There is rising level of private insurance and corporate investment (Stocker, Waitzkin and Iriat 1999), as governments come under pressure from the private sector and trade-related policies to break up universal social security funds and to open up the market to foreign investment. Finally, some health care provides, who benefit from providing care to the privileged and better resourced market, will challenge any reforms aimed at universalizing health care systems, often claiming that they would reduce standards of care and invoking the rights of individuals to the best care they can afford. The implication is that equity is a secondary concern.

It is common that private companies dump their patients arbitrarily onto the public sector when their health care costs become too great.

3. The commercialization of healthcare: The collapse of the public sector has led to the emergence of a disorganized, unregulated and even chaotic provider market in many developing countries, particularly at the primary level of health care. The incapacity of public services has also resulted in governments and donors relying upon NGOs, UN agencies, charities, religious groups and humanitarian organizations to plug the gaps in public provision not only in primary care but also in essential hospital services. The private provider market is also heterogeneous and may include non-profit, charitable

organizations: single, stand-alone private hospitals or group practices; employer-based health maintenance organizations; and large corporate or business entities with public shareholders.

Private health care is clearly associated with profit, exploitation and preferential service of higher income groups. It results in inefficient, inequitable and poor quality care (woolhandler and Himmelstein 2004, Deveraux et al. 2002, Evans 1997). It also results 'Over-servicing' means conducting unnecessary and inappropriate laboratory tests and diagnostic investigations. Market-driven health care often does not promote efficiency or quality for several obvious reasons (Bloom 1991, Roemer 1963, Rice 1997):

i) Most patients do not have enough knowledge to make informed choices about the relative quality or merits of different health care providers, nor are they willing, able or assertive enough to negotiate on price and quality, especially when care is urgent, when sickness results in vulnerability, or when illiteracy and poverty are prevalent. Most people do not want 'choice' in health care, but an assurance that their local and accessible health care provider will provide good, if not the best, quality care. Instead, commercialized health care eats away at provider-patient trust, adding to the stress of being sick or injured.

ii) Competition results in duplication and inequity as for-profit providers gravitate towards affluent populations (McPake 1997).

Table 1.2: Differences in vertical and integrated program

Vertical Program	Integrated Program
Advantage	**Advantage**
* Clear objectives and targets motivate staff	Clear integrated objectives help national development
* Operational planning is focused and easy to deliver	Operation planning need incorporation of different components of the health systemm indicates multi-dimensional concept of health
* Efficient and effective delivery is possible which brings improvement or achievement of target	Efficient and effective delivery is possible through inter-departmental and inter-sectoral collaboration
* Ability to monitor restricted output indicates resolution of problems	Has capacity to accommodate extra work/in disasters Limited resources are used for more activities
	Allow people to participate in the program
	Respond to people's need (individual and Community), which ensure more user satisfaction
	Cost effective in the long run
	All more holistic approach to health
Disadvantage	**Disadvantage**
* Has no capacity to accommodate extra work/in disasters	Sometimes fail to target priority appropriately
* Resources are used for specific activities only because of difficulty in monitoring & evaluation	Complex programming may lead to more failure
* Allow people to participate in a specific manner and do not care for overall development	Lack of expertise in integrated program management
* Program is always dependent on donors for funding, which may affect sustainability and autonomy for local authority	
* Placement of workers after completion of program is very difficult	
* May not be able to sustain public motivation for long	
* May not be cost effective in the long run	

iii) Commercialized health care systems often have significant transaction costs accompanying attempts to manage or regulate the market (Himmelstein et al. 1999) at the expense of patients and the public good spending large amount of money on systems designed to catch.

iv) Market-based system with multiple independent providers pose barriers to developing important public health instruments such as disease surveillance systems.

v) Competition harms collaboration between different providers, often an important ingredient of good quality care. In China, for instance, competition within the public sector harmed the inter-provider cooperation that was necessary for effective disease surveillance (Liu and Mills 2002).

4. Vertical Programming: 'Vertical programs' generally meaning separate health structures with strong central management dedicated to the planning, management and implementation of selected interventions-partly because of a lack of adequate health care infrastructure, but also because it often reflects a scientific and biomedical orientation that emphasizes the delivery of 'medical technologies' amenable to vertical programs. Just as smallpox was eradicated through a concerted global effort, for instance, it is argued that diarrhoeal disease, malaria, HIV, TB, Leprosy, Polio and other common disease can be tackled in a similar way. There are some success stories.

But these are questions on appropriateness of certain technologies. For example, the biomedical orientation result in the promotion of manufactured oral rehydration salts rather than more appropriate and accessible rehydration fluids that could be prepared locally (Werner and Sanders 1997).

Vertical programs can also lead to the de-skilling of primary health care workers as their focus narrows to achieving selected targets rather then addressing the immediate and pressing needs of sick people when they present to health care services.

Thousands of family planning volunteers have been deployed in many countries, for instance, but many opportunities to promote health were lost because their training focused on the single technical issue of contraception and did not include other elements of community health promotion, such as nutrition and hygiene education (Toole et al. 2003).

Vertically organized health services are inconvenient to service users. The need to make several visits to access different services constitutes a significant barrier to access.

Pulse Polio Mass immunization campaigns, for example have often been prioritized to such an extent that other service have disrupted and the long-term development of sustainable routine immunization services hindered. In many countries immunization coverage rate are stagnant or declining. In others, the reduction in child mortality rates have slowed down (Black et al 2003).

Narrow, selective or disease-based programs or initiatives are not inherently bad, nor are they always influenced by undue commercial considerations. For some health interventions, for example those related to the control of vector for infectious disease such as mosquitoes, or those related to the control of acute disease outbreaks, a vertical and centralized approach may be entirely appropriate. Today, however, there is a growing proliferation of initiatives and programs that collectively undermine national planning and coordination; a biomedical, technological bias towards health improvement; inappropriate public-private 'partnerships'; and the more long-term and sustainable approaches to health systems development.

The World Bank proposed that only this vertical package should qualify for public funding- services outside the package that it deemed were not cost effective were considered discretionary and would have to be funded by individuals out–of–pocket or through insurance.

Consider the case of a single-handed poor farmer who develops a disabling (groin) hernia. His condition would be excluded from public funded treatment because the number of 'disability-adjusted life years' that would be gained by the farmer would not represent good value for money.

Access to adequate volumes of clean water not only reduces the incidence of diarrhoeal disease, intestinal worms, skin and eye diseases, but also improves child

and maternal health indirectly by enabling women to spend more time on other activities such as child care or however, the World Bank did not classify improving access to clean water as a cost-effective health intervention. Integrated programming has edge over vertical on various accounts as given in table 1.2.

5. Public sector failure: Illegitimate and corrupt governments that steal from the public purse, practice and tolerate human rights abuses, and allocate inappropriately high budgets to the military or to projects that benefit the elites of society are clearly one root cause of public sector failure.

Richer countries or institutions endorse and support corrupt governments. In return they do arms trade; Western corporations paying bribes for getting clearance from local governments (Pogge 2002). Some research suggests an independent positive association between health and democracy, political rights and civil liberties (Franco et al 2004). So undemocratic conditions link with public health failure.

Bureaucratic failures: Rigid civil service rules and regulations combined with poor management and leaderslip can impair innovation, motivation, efficiency and community responsiveness. Civil servants can bend or use the rules or use their positions to serve their own personal needs. Government health departments have vast responsibilities and varied challenges; they simply cannot succeed without a minimum degree of management and administrative capacity and competence at all levels of the health care system. The influence of donors and international agencies on the functioning of the Ministries of Health in developing countries can be enormous.

Of the developments during the last few years that may have a significant positive influence on health services and population health globally, the most important and novel are the setting of the Millennium Development Goals by the United Nations Millennium General Assembly, based on the Millennium Summit in September 2000.

MILLENNIUM DEVELOPMENT GOALS

The new century opened with new technology, scientific development, resources, political stability, cooperation but with wide disparity between rich and poor in terms of distribution of food, shelter, environmental resources, and problems such as illiteracy, unemployment, poor health services, poor water supply and sanitation, etc. These new developments and challenges have been recognized by the world community with an unprecedented declaration of solidarity and determination to rid the world of poverty. In 2000 the UN Millennium Declaration, the world leaders came to work together to meet concrete targets for advancing development and reducing poverty by 2015 or earlier. Emanating from the Millennium Declaration, the Millennium Development Goals bind countries to do more in the attack on inadequate incomes, widespread hunger, gender inequality, environmental deterioration and lack of education, health care and clean water.

Millennium development goals have been set by the United Nations and health has been identified as a significant area of concern. There are 6 of 8 goals, 9 of 18 targets and 18 of 48 indicators related to health.

These are as follows:

Goal 1: Eradicate poverty and hunger.

Target 1: Halve hunger, between 1990 and 2015, the proportion of people whose income is less than one dollar a day.

Target 2: Achieve full and productive employment and decent work for all, including women and young people.

Target 3: Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

Indicators

- Prevalence of underweight children (under five year of age).
- Proportion of population below minimum level of dietary energy consumption

Goal 2: Universal primary education.

Target 1: Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling.

Goal 3: Promote gender equality & empower women.

Target 1: Eliminate gender disparity in primary and secondary education, preferably by 2005, and to all levels of education no later than 2015.

Goal 4: Reduction of child mortality.

Target 1: Reduce under five mortality by two third,

Indicators

- Under five mortality rate,
- Infant mortality rate,
- % of 1 year old children immunized against measles,

Goal 5: Improve maternal health.

Target 1: Reduce maternal mortality by three-quarters.

Indicators

- Proportion of births attended by skilled health personnel.
- Maternal mortality ratio.

Goal 6: Combat HIV/AIDS, Malaria & other diseases.

Target 1: Have halted by 2015 and begun to reverse the spread of HIV/AIDS.

Indicators

- HIV prevalence among 15-24 year old pregnant women.
- Condom use rate out of total prevalence of contraceptive use rate.
- Number of children orphaned by HIV/AIDS.

Target 2: Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases.

Indicators

- Prevalence and death rates associated with malaria.
- Proportion of population in malaria risk areas using effective malaria prevention and treatment measures.
- Prevalence and death rates associated with tuberculosis.
- Proportion of tuberculosis cases detected and cured under directly observed treatment short course.

Goal 7: Ensure environmental sustainability.

Target 1: Integrate the principles of sustainable development into country policies and programs and reverse the loss of environmental resources.

Target 2: Reduce biodiversity loss, achieving by 2010 a significant reduction in the rate of loss.

Target 3: Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.

Target 4: by 2020, to have achieved a significant improvement in the lives of a least 100 million slum dwellers.

Access to safe drinking water

Indicator

- Proportion of population with sustainable access to an improved water source, urban and rural.

Improve sanitation

Indicator

- Proportion of urban population with access to improved sanitation.

Reverse loss of resources.

Indicator

- Proportion of population using solid (biomass & coal) fuels.

Goal 8: Development of a global partnership for development.

Target 1: Develop further an open, rule-based, predictable, nondiscriminatory trading and financial system (includes a commitment to good governance, development and poverty reduction-both nationally and internationally).

Target 2. Address the special needs of the least developed countries (includes tariff and quota-free access for least developed countries exports; enhanced program of debt relief for heavily indebted poor countries and cancellation of official bilateral debt; and more generous Overseas Development Agency (ODA) for countries committed to poverty reduction).

Target 3: Address the special needs of landlocked countries and small island developing states (through the program of action for the sustainable development of Small Island developing states and the outcomes of the 22nd special session of the general assembly).

Target 4: Deal comprehensively with the debt problems of developing countries through national and international measures in order to make debt sustainable in the long term.

Target 5: In cooperation with developing countries, develop and implement strategies for decent and productive work for youth.

Target 6: In cooperation with pharmaceutical companies, provide access to affordable, essential drugs in developing countries.

Indicator

- Proportion of population with access to affordable essential drugs on a sustainable basis,

Target 7: In cooperation with the private sector, make available the benefits of new technologies, especially information and communications.

Challenges for MDGs

- MDGs once again focussed more on numbers than quality of life. Analysis was carried out at aggregate level, i.e., at the level of country. This is meaningless in a large country like India.
- Attainment of MDGs largely depended on the performance of poorest states of India (UP, Bihar, Rajasthan, Orissa, MP) because they were most populous and had worst indicators. UP, MP, Bihar and Rajasthan accounted more than 50% of IMR of India. In the state certain villages were worst in IMR and current survey did not reflect this.
- Governance failure: law of land, sound economic policies, appropriate public investment, public administration, human rights and support to civil society organizations are major concerns. They differ from one country to another and priorities were also different.
- Some areas and regions are more prone to poverty because of their vulnerability to infection and diseases. Heavy morbidity and mortality is associated with poverty.
- Health seeking behavior is different in different cultures and need to be addressed.
- Caste and race are important determinants but totally neglected in the report.
- There is more emphasis on male involvement.
- Missing indigenousness in programs.

MDG on Gender parity that was to be achieved by 2005 had failed and earned a shameful place in history as the world has missed the first of MDGs' targets. South Asia remains the most educationally unequal region in the world; women average only about half as many year of education as men, and female secondary level enrolment rates are only two third of male rates. Universal primary completion is progressing very slowly. There is important progress towards all eight goals, but not on track to fulfil the commitments. The tasks have now become more challenging because the largely benign development environment that has prevailed since the early years of this decade, and that has contributed to the successes to date, is now threatened. There is global economic slowdown and a food security crisis, both of uncertain magnitude and duration.From the begining the funding for MDG was low. Global warming has become more apparent. These developments will directly affect the efforts to reduce poverty (UN 2008).

SUSTAINABLE DEVELOPMENT GOAL

In continuation of MDG, on 1 January 2016, the 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development — adopted by world leaders in September 2015 at an historic UN Summit — officially came into force. Over the next fifteen years, with these new Goals that universally apply to all, countries will mobilize efforts to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind.

The SDGs build on the experience of the Millennium Development Goals (MDGs) and aim to go further to end all forms of poverty. The new Goals are unique in that they call for action by all countries, poor, rich and middle-income to promote prosperity while protecting the planet. They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and addresses a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection.

Sustainable development means to meets the needs of the present without compromising the ability of future generations to meet their own needs. While the SDGs are not legally binding, governments are expected to take ownership and establish national frameworks for the achievement of the 17 Goals. Countries have the primary responsibility for follow-up and review of the progress made in implementing the Goals, which will require quality, accessible and timely data collection. Regional follow-up and review will be based on national-level analyses and contribute to follow-up and review at the global level.

SDGs are different from MDGs on following points:
1) The 17 Sustainable Development Goals (SDGs) with 169 targets are broader in scope and go further than the MDGs by addressing the root causes of poverty and the universal need for development that works for all people. The goals cover the three dimensions of sustainable development: economic growth, social inclusion and environmental protection.
2) Building on the success and momentum of the MDGs, the new global goals cover more ground, with

- Poverty and hunger;
- Widening gaps between rich and poor nations and inequalities within the countries;
- Lack of access to basic needs such as food, water, sanitation, land, shelter and education;
- Rapid depletion of natural resources;
- Upsurge of conflicts/violence between the countries and communities;
- The world's resources increasingly concentrated in the hands of few who further strive to maximize their profit;
- New economical/political policies affecting lives, livelihoods, health and well-being of people in south and north hemisphere;
- Public services deteriorating, unevenly distributed and inappropriate; and
- Privatization affecting principles of equity.

Principles adopted by the People's Charter for Health

- Health is a fundamental human right.
- Primary Health Care (1978 Alma Ata Declaration) as the basis for policy.
- Government's fundamental responsibility to ensure access and quality.
- People and people's organization is essential to the formulation, implementation, and evaluation of health programs.
- Political/economic/social/environmental factors are primary determinants of health and must get top priority in policy making.
- Action at all levels to tackle crisis-individual, community, national, regional and global.

MUMBAI DECLARATION

The Mumbai Declaration is the consensus document of the **III International Forum for the Defense of the People's Health** held in Mumbai in 2004 and organized by the People's Health Movement. All member countries and participants reaffirmed the validity and relevance of the People's Charter for Health, the foundational document of the People's Health Movement, which describe increasing and serious threats to health in the early 21st century.

Since the Charter's adoption in December 2000 at the first People's Health Assembly, at GK Savar, Bangladesh, the health of the world's poor has worsened and more threats to people's health have emerged.

Social, political, economic and environmental threats to health identified as the basic causes of ill health and the inequitable distribution of health within and between countries have increased.

The III International Forum for the Defense of the People's Health has provided opportunities to hear inspiring testimonies, from the world's poor and health activists:

- Denouncing the denial of health to their communities and their efforts to overcome this injustice.
- Threats to health from the unfair system of global trade and the imperialist policies of developed countries including unjust wars and efforts to counter them.
- The Demands for acknowledgment of health as a universal human right and the implementation of Comprehensive Primary Health Care as a strategy to achieve Health for All.

The Forum also recognized the particular discrimination suffered by many groups which makes achieving Health for All even more difficult. These included women, people with disabilities, sex workers, children living in difficult circumstances (including street children), migrant workers, Dalit people, Indigenous peoples in rich and poor countries, and all those affected by wars, disasters and conflicts.

THE DATA SOURCES FOR DEMOGRAPHIC AND HEALTH STATISTICS

There is always demand for having periodic information on diverse aspects of socioeconomic, health and other aspects of the population in India. Such information helps in policy making, program implementation as well as in monitoring of the programs. The data sources commonly utilized for such purposes are one or a combination of the following: registration and surveys - both complete enumeration surveys and sample surveys. Administrative reporting also provides information in many cases. For informed decision making it is pertinent to check the coverage, reliability and timeliness of the different sources. Following are the sources of data on population characteristics (Table 1.3):

1. Census: Census is generally a decennial affair. India is the second most populous country in the world. According to 2001 census, its population was 1028 million distributed over 28 states and 7 union territories. The Indian Census is the most credible source of information on Demography (Population characteristics), Economic Activity, Literacy & Education, Housing & Household Amenities, Urbanization, Fertility and Mortality, Scheduled Castes and Scheduled Tribes, Language, Religion, Migration, Disability and many other socio-cultural and demographic data since 1872. Census 2011 was the 15th National Census of the country. This is the only source of primary data at village, town and ward level. It provides valuable information for planning and formulation of polices for Central and State Governments and is widely used by National and International agencies, scholars, business people, industrialists, and many more. The delimitation/ reservation of Constituencies - Parliamentary/ Assembly/ Panchayats and other Local Bodies is also done on the basis of the demographic data thrown up by the Census. Census is the basis for reviewing the country's progress in the past decade, monitoring the on-going schemes of the Government and most importantly, plan for the future. That is why the slogan of Census 2011 was "Our Census, Our Future". The Census is a statutory exercise conducted under the provisions of the Census Act 1945 and Rules made there under.

As an organization, the census works under the Union Home Ministry, with the Registrar General also designated as the census commissioner. Since 1961 it has been working on a permanent basis to have continuity to plan and organize the census in the country (Registrar General and Census Commissioner, 2001). Almost every state and union territory has a permanent Directorate of Census Operations to carry out the census work.

The Census process involves visiting each and every household and gathering particulars by asking questions and filling up Census Forms. Government servants duly appointed as Enumerators visits each and every house and collect the information required. The information collected about individuals is kept absolutely confidential. In fact this information is not accessible even to Courts of law. After the field work is over the forms are transported to data processing centers located at 15 cities across the country. The data processing is done using sophisticated software called Intelligent Character Recognition Software (ICR). This technology was pioneered by India in Census 2001 has become the benchmark for Censuses all around the globe. This involves the scanning of the

Table 1.3: Sources of data

Source	Periodicity	Estimated parameters	Small area Estimates	Usability
SRS	Annual, since 1970	Fertility, Mortality	State level	Representative sample. Regular availability of reports Reliable source.
Census	10 years	Population count by age, sex, area IMR. Child mortality	Population counts: Down to village level. Mortality: District level	Population data, reliable & Valid available within about 2 years. Fertility and indirect mortality estimates. About 8 year time lag.
CRS	Annual since 1958	Fertility & Mortality indicators	District Level and large cities with > 1 lakh population	<50% of deaths are registered. With interstate variation. Publications are irregular
NFHS	I=1992-93 II=1998-99 III=2005-06 IV=2014-15	IMR (Indirect estimates)	State Level Estimates. Sample is small for district level	Indirect estimates. Quick estimates on IMR and fertility and other health indicators including Socioeconomic variables

Census Forms at high speed and extracting the data automatically using computer software. This revolutionary technology has enabled the processing of the voluminous data in a very short time and saving a huge amount of manual labor and cost.

All usual residents are eligible to be included irrespective of their Nationality. Each and every household is given an Acknowledgement Slip at the time of enumeration. The data is then entered into computers in the local language of the State as well as in English. Once this database has been created, biometrics such as photograph, 10 fingerprints and probably Iris information are added for all persons aged 15 years and above. This is done by arranging camps at every village and at the ward level in every town. Each household is required to bring the Acknowledgement Slip to such camps. Those who miss these camps are given the opportunity to present themselves at permanent NPR Centers to be set up at the Tehsil/Town level. In the next step, data is printed out and displayed at prominent places within the village and ward for the public to see. Objections are sought and registered at this stage. Each of these objections is then enquired into by the local Revenue Department Officer and a proper disposal given in writing. Persons aggrieved by such order have a right of appeal to the Tehsildar and then to the District Collector. Once this process is over, the lists are placed in the Gram Sabha in villages and the Ward Committee in towns. Claims and Objections are received at this stage also and dealt with in the same manner described above. The Gram Sabha/Ward Committee has to give its clearance or objection within a fixed period of time after which it is deemed that the lists have been cleared. The lists thus authenticated are then sent to the Unique Identity Authority of India (UIDAI) for de-duplication and issue of UID Numbers. All duplicates are eliminated at this stage based on comparison of biometrics. Unique ID numbers are also be generated for every person. The cleaned database along with the UID Numbers are then sent back to the Office of the Registrar General and Census Commissioner, India (ORG&CCI) and are formed the National Population Register. As the UID system works on the basis of biometric de-duplication, in the case of persons of age 15 years and above (for whom biometrics is available), the UID Number is available for each individual. For those below the age of 15 years (for whom biometrics is not available), the UID Number is linked to the parent or guardian. Although process has been started but UID Number will be given in phased manner.

Two Forms are canvassed in each household. The first relates to the Houselisting and Housing Census. In this, 35 questions relating to Building material, Use of Houses, Drinking water, Availability and type of latrines, Electricity, possession of assets etc. are canvassed. The second form relates to the National Population Register. In this the following will be canvassed:

- Name of the Person
- Gender
- Date of Birth
- Place of Birth
- Marital Status
- Name of Father
- Name of Mother
- Name of Spouse
- Present Address
- Duration of stay at Present Address
- Permanent Address
- Occupation
- Nationality as Declared
- Educational Qualification
- Relationship to Head of family

The general experience is that one gets better cooperation from illiterate households in rural areas, compared to literates in metropolitan cities. However, illiterate people in rural areas generally lack knowledge about their age, a parameter which is crucial in estimating different demographic parameters. The preference for reporting ages ending with 0 and 5 can be measured by **Whipple's index**. The index takes a value between 100 and 500. The index score is obtained by summing the number of persons in the age range 23 and 62 inclusive, who report ages ending in 0 and 5, dividing that sum by the total population between ages 23 and 62 years inclusive, and multiplying the result by 5. Restated as a percentage, index scores range between 100 (no preference for ages ending in 0 and 5) and 500 (all people reporting ages ending in 0 and 5 (Henry 1976). An index value less than 110 is regarded as 'accurate' age reporting, that is, there is no preference for digits ending with 0 or 5. The age reporting is considered to

be 'rough' if it varies between 125 and 175, and 'very rough' if it crosses 175, in which case there is heavy concentration in the reporting of ages 0 or 5. The net omission rate per 1000 persons is slightly higher for females than males.

2. Civil Registration System (CRS): Civil registration is a continuous recording of vital events such as births, deaths, marriages etc. It is generally a compulsory recording done according to the legal requirements of the country as per the provision made by official order or rule. Unlike census which provides idea about population of a given area at a point of time, it helps in understanding in a continuous manner the additions and exits of people in the area. Apart from maintenance of permanent records on births, deaths and marriages as legal documents and estimates of changes in population, it is also extremely important for need based development planning. It helps in understanding the progress of different socioeconomic programs, including the maternal and child health care programs. In India, the registration of vital events has been in vogue for more than a century. In 1969, Registration of Births and Deaths Act was implemented. The registration of births and deaths was made compulsory, and the act unified the system of registration, replacing the diverse laws that existed earlier. The civil registration system in India, at the national level, works under the Registrar General of India. He coordinates the activities of Chief Registrars of the States who are the chief executive authorities in the state for carrying out the provisions made in the Act of 1969. The system collects a variety of information on each birth and death recorded. For births, we have date of occurrence/registration; place of birth; order of birth; sex of child; age of mother; literacy, occupation and religion of parents and type of medical attention at birth are noted. In case of deaths, the system provides data on occurrence/ registration; place of death; age , sex, marital status, religion and occupation of deceased; cause of death and whether it is medically certified; and type of medical attention received.

The improvements in the civil registration system in India have been slow. The extent of birth registration in India was only 39% in 1985, which increased to 55% in a decade's time. Among the major states (with a population of 20 million and above) only in six states, namely, Kerala, Gujarat, Karnataka, Maharashtra, Punjab and Tamil Nadu the extent of birth registration is more than 80%. In general, the extent of registration is better in case of births than deaths. In another survey known as Multiple Indicator Survey (MICS) – 2000, birth registration among children below 5 years was ascertained.

Interestingly, a major reason for non-registration of births was lack of knowledge that birth registration was needed. A sizable proportion of respondents reported that it was not considered important or they did not have knowledge about where to register.

3. Sample Registration System (SRS): This system was initiated by the Registrar General of India as a temporary alternative to obtain more reliable estimates of vital rates till civil registration came into being to serve the same purpose. It was started in 1969-70 on a regular basis at the all India level. It is in essence a demographic survey based on a *dual recording system.* It provides estimates for both rural and urban areas at the state (major states) as well as national levels. Both the estimates of fertility and mortality are made available on an annual basis. It is based on a dual recording system of births and deaths in a nationally representative sample of villages and urban blocks. Initially a baseline survey is carried out in the selected sample units to get the usual resident population. This is a complete census count, which is carried out by staff from state or district census directorate with the help of a local part time enumerator. A continuous enumeration of vital events occurring to the usual resident population in the sample area is done by the local part-time enumerators. To strengthen the estimates of vital events, every six months an independent survey is conducted in a sample area to record vital events in the previous six months. Matching of events is done using information from two sources (the continuous register and the half-yearly survey), and further field verification of unmatched and partially matched events is carried out. The estimates of vital events are arrived at using information from both sources.

The Infant Mortality is the decisive indicator for estimation of sample size at Natural Division, the ultimate level for estimation and dissemination of indicators for rural areas. The permissible level of error has been taken as 10 prse (percentage relative

standard error) at Natural Division level for rural areas and 10 prse at state level for urban areas, in respect of major states having population more than 10 million as per Census 2001. For minor states, 15 prse has been fixed at the total state level. By and large, the above criteria has been followed, however, there have been a few exceptions, on account of operational constraints. Based on the above criteria, the number of units has been increased from 6671 to 7597 with 4433 in rural and 3164 in urban areas (Census of India Registrar General).

SRS estimates of vital rates are being used extensively for policy making and planning purposes. In the absence of reliable CRS data, the SRS has been the authoritative source of estimating vital rates at the national and state levels. Registrar General of India also uses SRS data for obtaining abridged life tables at the national and state levels. However, it is not a substitute for the CRS. It does not provide estimates at lower level of aggregation. Even at the state level, questions are being raised about the adequacy of sample size of the SRS to provide reliable estimates. For example, the chance of giving a birth for a woman in a year depends on her pregnancy status in the previous year. One does not know the extent to which this might bias the estimate. The sample units in SRS are revised periodically, at an interval of only about ten years.

There are studies to indicate that there might be under-registration of births in SRS. The SRS estimates are based on dejure population (defined in terms of usual place of residence). There is a practice in India that a woman goes to her parents' house for delivery, particularly at the time of first delivery. This means that she will be away from her usual place of residence for quite some time. The SRS may not be able to have complete information about recent births to usual residents who are temporarily absent. Information on most but not all, of these births may be available later in the next half-yearly survey (Narasimhan et.al. 1997). This effect is likely to produce a bias towards underestimating fertility at ages 15-19, when women are more likely than at older ages to visit their parents' home for delivery. Apart from this, there is also the problem of correct age reporting that affects estimation of age patterns of fertility (Narasimhan et al 1997).

From 2002 onwards, the SRS included a new method called the "**RHIME**" or **R**epresentative, **R**e-sampled, **R**outine **H**ousehold **I**nterview of **M**ortality with **M**edical **E**valuation. This is an enhanced form of "verbal autopsy" which is the key feature of a prospective study of 1 million deaths within the SRS. The RHIME method required repeated training of the SRS supervisors on how to collect the symptoms, signs and key circumstances leading to death using a two-page structured form which has also provision to record a brief narrative. Other features of RHIME include random re-sampling of field-work by an independent team for maintaining quality of data. Importantly, field-staff were instructed not to assign a cause of death, but only collect the major symptoms and narrative of the events leading up to death. The assignment of causes of death involved central medical evaluation by two independent trained physicians who would examine the field reports using a web-based system piloted for this study. Physicians undergo standardised training and have guidelines for the most common causes, including maternal causes of death. The two physicians, based on examination of household reports, would either agree on the underlying ICD-10 code (to 3 digits) assigned for the cause of death pending which their forms would be anonymously shuffled between them for reconciliation. Continuing disagreements would be referred to a senior third physician who adjudicated the final ICD-10 code.

4. Official Statistics: In an official program there is generally a built-in information system that provides variety of information. For example, the family welfare program in India generally makes available data on number of acceptors of different family planning methods by different characteristics; number of children who are given immunization against the preventable diseases like BCG, DPT, Polio and Measles; and number of pregnant mothers who are given TT injection and IFA tablets. Such information can be used to obtain estimates of the proportion of couples using different family planning methods, percent of children who are immunized against different diseases and percent of pregnant mothers who are given TT and IFA. In fact, the Ministry of Health and Family Welfare, Government of India publishes, in its Family Welfare Year Book, such estimates periodically. For example, the acceptor data can be fruitfully converted into an index to understand

the percent of couples protected by the program at a given point. This index, if not exactly equal, is very similar to the Contraceptive Prevalence Rate (CPR) obtained in a survey. Doubts have been raised about the reliability of these statistics.

5. Sample Surveys: Surveys, where information is collected on a sample basis, are particularly suitable to provide variety of information with a fair degree of precision. Using a scientifically adopted sample design, the sampling error can be controlled to a large extent. Also, careful planning, elaborate training of investigators and supervisors and effective monitoring and supervision can help in controlling the non sampling errors. The total error in a careful and well designed sample survey can be less than that in a complete enumeration survey. Sample surveys have become a viable tool for collecting information on a variety of demographic and health related indicators.

In India, since 1990 there has been a noticeable change in the availability of large scale surveys in the field. Three rounds of the National Family Health Survey (NFHS) have been conducted on the lines similar to Demographic Health Surveys (DHS). NFHS -1 was conducted in 1992-93 wherein 88562 households and 89777 ever married women age 13-49 were interviewed to furnish estimates on different demographic and health parameters for the country as a whole and 24 states and the National Capital Territory of Delhi. It provided information on fertility, family planning practices, mortality including infant and child mortality, utilization of maternal and child health care services, nutritional status of children, apart from the usual socioeconomic and demographic characteristics of a household.

NFHS-2, which was conducted in 1998-99, covered 92486 households and 90303 ever married women age 15-49, and included estimates, in addition to the national level, for all the states that existed at that time. For the four larger states, namely, Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan, it provided estimates at the regional level. It also made available estimates for the four metropolitan cities such as Mumbai, Kolkata, Delhi and Chennai. In addition to information collected in NFHS-1, it included information on quality of family welfare services, prevalence of reproductive morbidity among women, extent of involvement of women in decision making and domestic violence. Another feature of NFHS-2 has been the collection of data on the hemoglobin level in the blood of women and their children age 6-35 months. Information from NFHS have been widely used by planners, policy makers and academicians.

Most recently the third round of NFHS was completed and findings are presented in chapter 2. All the three rounds of NFHS were conducted by the International Institute for Population Sciences (IIPS), Mumbai, an autonomous institution under the administrative control of Ministry of Health and Family Welfare, Government of India, with technical support from ORC Macro, Maryland, USA and East West Centre, Hawaii, USA. The Ministry of Health and Family Welfare, Government of India designated IIPS as the nodal agency to carry out the survey.

There have been quite few other notable surveys in the field in India in recent years. One such survey, which was also conducted by IIPS is known as Rapid Household Survey in Reproductive and Child Health:

District Level Household Survey. Since the indicators estimated through SRS and NFHS are confined to state level only, the concept of providing similar indicators at district level had been perceived through DLHS. Now district level area planning is based on district data obtained in DLHS. While first round of DLHS was undertaken in 1998-99, the second DLHS was undertaken during 2002-04. The results of the second round of the DLHS (2002-2004) were released in March, 2006 to serve as the Base-line survey for the NRHM. The DLHS-II covered 1000 households per district and the DLHS-III would have a varying sample size ranging from 1000 to 1500 households in each of 600 odd districts in the country depending on the variability of health parameters. All eligible women (currently married and usual residents of a household) age 15-44 and men age 20-54 in a selected household were also selected for interview. The objective of the survey was to understand the process indicators of reproductive and child health in a district (IIPS, 2001). Specifically, it collected information on marriage pattern, antenatal care, delivery care, child care practices like breast feeding and immunization, use of contraception, choice of contraceptive methods among women and men, utilization and quality of government

Table 1.4: Top ten causes of deaths in India classified according to areas of residence and gender

		Populations		Gender	
Rank	India (all age groups)	Rural	Urban	Men	Women
1	Cardiovascular	Cardiovascular	Cardiovascular	Cardiovascular	Cardiovascular
2	COPD, asthma	COPD, asthma	Cancers	COPD, asthma	Diarrhea
3	Diarrhea	Diarrhea	COPD, asthma	Tuberculosis	COPD, asthma
4	Perinatal	Perinatal	Tuberculosis	Diarrhea	Respiratory Inf
5	Respiratory Inf	Respiratory Inf	Senility	Perinatal	Senility
6	Tuberculosis	Tuberculosis	Diarrhea	Cancers	Perinatal
7	Cancers	Cancers	Injuries	Respiratory Inf	Cancers
8	Senility	Senility	Ill defined	Injuries	Ill defined
9	Injuries	Injuries	Digestive	Ill defined	Tuberculosis
10	Ill defined	Ill defined	Respiratory Inf	Senility	Injuries

health care services, awareness about RTI, STI and HIV/AIDS among women and men and prevalence of RTI and STI (Symptoms) among women and men.

Multiple Indicator Survey (MICS-2000) was initiated by the United Nations Children's Fund, India Country Office, New Delhi in the year 2000. This was a household survey intended to collect information on indicators related to health, nutrition, education, water and sanitation. It collected information from 119305 household 5,741 children age 0-4, 136339 children age 5-14 and 142840 women age 15-49. It provided information for all states (except the states bifurcated recently) and union territories. Apart from age-sex and the usual socio economic characteristics of household, it gathered information on child health like birth weight of a child, feeding practices, immunization and occurrence of fever, cough, diarrhoea and night blindness. It also has data on pre-schooling among children age 36-59 months and school attendance among children age 6-10 years. Interestingly, it gives information on birth registration and living arrangements of children (percent of children below 15 years not living with their biological parents, even

Table 1.5: Rank of disease according to mortality in the world in 2002, and projection for 2030

Category	Disease or Injury	2002 Rank	2030 Ranks	Change in Rank
Within top 15	Ischaemic heart disease	1	1	0
	Cerebrovascular disease	2	2	0
	Lower respiratory infections	3	5	-2
	HIV/AIDS	4	3	+1
	COPD	5	4	+1
	Perinatal conditions	6	9	-3
	Diarrhoeal diseases	7	16	-9
	Tuberculosis	8	23	-15
	Trachea, bronchus, lung cancers	9	6	+3
	Road traffic accidents	10	8	+2
	Diabetes mellitus	11	7	+4
	Malaria	12	22	-10
	Hypertensive heart disease	13	11	+2
	Self-inflicted injuries	14	12	+2
	Stomach cancer	15	10	+5
Outside top 15	Nephritis and nephrosis	17	13	+4
	Colon and rectum cancers	18	15	+3
	Liver cancers	19	14	+5

Source: Mathers CD, Loncar D 2006

though either parent is alive). For women, it has information on marriage, fertility, contraception, utilization of maternal care services and awareness of HIV/AIDS. Although the survey was not geared towards estimating fertility (it did not collect information on birth history), the estimates of total fertility rate provided by it compare well with the SRS estimates. In fact, the estimates are somewhat higher than those of SRS in many states. The fertility rate in the survey has been derived based on births occurring to women during the last one year. Such data are likely to suffer from time reference error. Births occurring beyond 12 months may be reported as those occurred during an year. Another point worth considering is that the focus of the survey was on immunization and there are lots of information was collected for children 12-23 months old. An investigator would be tempted to under report age of a child (from, say, 12 or 13 months to below 12 months) in order to lessening her workload.

Village Health Surveys: The Implementation Frame work approved by the Union Cabinet includes a proposal for having periodic village level (Health) household surveys to be conducted by ASHA (Accredited Social Health Activist) the Community Worker with the support of Village Health & Sanitation Committee. If this can be strengthened it would provide for a system of reporting & collection of data at the village level, facilitate development of village block & District Level Health Action Plans under NRHM.

The **National Sample Survey Organization (NSSO)** carries out socio-economic surveys, undertakes field work for the Annual Survey of Industries and follow-up surveys of Economic Census, sample checks on area enumeration and crop estimation surveys and prepares the urban frames useful in drawing of urban samples, besides collection of price data from rural and urban sectors. This organization came into existence in 1950 and functions under the overall direction of a Governing Council with requisite independence and autonomy in the matter of collection, processing and publication of NSS data. In addition to the non-official Chairman, the Governing Council is composed of five academicians, five data users from Central and State Government departments and senior officers of the Ministry. The NSSO is headed by the Director General and Chief Executive Officer (DG&CEO) who is responsible for coordinating and supervising all activities of the organization and is assisted by a small secretariat called Coordination and Publication Division (CPD). The DG and CEO is also Member-Secretary of the Governing Council. He is assisted by one Additional Director General and 4 Deputy Director Generals. The major activities of the NSSO pertains to Survey Design, Field Operations, Processing of data collected and releasing of the results based on surveys. The Survey Design and Research Division and Data Processing Division have their headquarters at Kolkata. The Field Operations Division has its headquarters at Delhi and Faridabad with a network of six Zonal offices, 48 Regional Offices and 117 Sub-Regional offices spread throughout the country. The Data Processing Division with its headquarters at Kolkata has Data Processing Centres at Delhi, Giridih, Nagpur, Bangalore, Ahmedabad and Kolkata. The division is entrusted with the responsibilities of data entry, processing and tabulation of socioeconomic data (Roy et al IPP).

The National Sample Survey Office's (NSSO) 68th round of survey is based on samples consisting of 7,496 villages in rural India and 5,263 urban blocks except some remote areas, during July 2011—June 2012.

Table 1.6: Top Risk factors leading to Disease, Disability, or Death

Poorest Countries	Developed Countries
1. Underweight	1. Tobacco
2. Unsafe sex	2. High blood pressure
3. Unsafe water & sanitation	3. Alcohol
4. Indoor Smoke & Solid Fuels	4. High Cholesterol
5. Zinc Deficiency	5. High BMI
6. Iron Deficiency	6. Low fruits & veg. intake
7. Vitamin A Deficiency	7. Physical Inactivity
8. High blood Pressure	8. Illicit Drugs
9. Tobacco	9. Unsafe sex
10. High cholesterol	10. Iron deficiency

MAPEDIR

"Maternal and Perinatal Death Inquiry and Response" (MAPEDIR) means to thoroughly examine and respond to the social, biological and medical events that led to a maternal or perinatal death. Inquiries are conducted of the deaths that occur in a community over several months time, in order to identify common factors that can be acted upon to prevent further deaths. Ongoing inquiries over several years allow a

community to assess the impact of its preventive actions and the need for additional interventions. Death inquiries are conducted in the community using a "verbal autopsy" interview with the families of deceased persons. This is particularly helpful in areas where many deaths occur outside of health facilities and for highlighting relevant social factors and health care seeking problems. Health facilities where many deaths occur also should review the care provided to the women and children in order to identify medical practices that need to be improved to prevent additional deaths. UNICEF is supporting the implementation of MAPEDIR project in the context of RCH2.

HEALTH INDICATORS

There are many indicators which can measure the burden of disease in a community. Based on severity and magnitude of a disease and its vulnerability to the control measures the priority for action is determined. Some of the important *indicators* are as follows:

1. Mortality indicators e.g. death rates, expectancy of life, IMR, age specific mortality rates, etc.; this is the most informative, simple, valuable indicator and used worldwide.
2. Morbidity indicators e.g. incidence and prevalence rates, admission rates, etc.;
3. Disability rates e.g. Sullivan's index, Disability Adjusted Life Years (*DALY*), work loss days, etc.;
4. Nutritional indicators e.g. low birth weight, weight to height, etc.
5. Health care delivery indicators e.g. doctor population ratio, doctor nurse ratio, etc.;
6. Utilization rate e.g. immunization coverage, etc.;
7. Socioeconomic and demographic status of the population.
8. Health System Research to determine better and cost effective methods of health delivery.

Disability Adjusted Life year

In the recent years, DALYs as an indicator has been used globally to measure the burden of disease. This indicator is now gaining reputation because of its capability to measure mortality (losses from premature deaths which are defined as the difference between actual age at death and life expectancy at that age in a low mortality population) and disability (loss of healthy life resulting from disability) together.

DALYs use standardized maximum life expectancies (80 years for men and 82.5 years for women) which are considerably higher than the levels of life expectancy currently achieved in developing countries. Using these standardized life expectancies either in measuring the global burden of disease or in cost-effectiveness analysis implicitly assumes that health interventions alone are capable of achieving an increase in the life expectancy to those higher levels. It is clear that many non-health circumstances will also need to change life expectancy to rise to the level used in the DALY calculations. These interventions would have to address the socio-economic determinants of health. They would include raising incomes, increasing female education, improving water supply and sanitation conditions, improving workplace safety, and reducing accidents and violence. Hence the burden that is measured by DALYs is the burden of disease and underdevelopment, and not that of disease alone.

To calculate the DALS from morbidity and premature mortality, a standard expectation of life at birth of 82.5 years is chosen for women and of 80 years for men. This gap is considerably smaller than the observed gender gap in life expectancy in low mortality populations, for example, Japan which has a gender gap of some 6 years. However, the gender gap of 2.5 years is argued to correspond purely to the biological difference in survival potential between males and females factoring out the effects on life expectancy of males greater exposure to social and other risk factors. It is nonetheless, an arbitrary choice.

The global burden of major diseases in 1990 and projected estimates as measured by DALY (% of total burden of disease) are given in table 1.3A and 1.3B. However, in rural areas one report of verbal autopsy showed that respiratory system related deaths are number one in rank and cardiovascular is second and lower respiratory tract diseases are number 3 (Palinivel 2013). The global burden of disease and injury based on current trends in the year 2020 would be:

1 Life expectancy will raise more for women than for men because of the greater impact of tobacco epidemic on men due to their higher rates of smoking. In developed world it would be 88 years for females, however, for men it would be just 58 in Sub-Saharan Africa.

2 Deaths from communicable diseases, maternal

and perinatal conditions, and nutritional deficiencies are estimated to drop from 34% of the total burden of disease to only 15%.

3 Deaths from noncommunicable diseases are likely to increase from 55% of the total burden of diseases to 73%.

4 The burden of disease as a result of psychiatric and neurological conditions will also increase greatly. In the future, burden of mental health conditions is estimated to rise from 10.5% to almost 15% of the total burden of diseases.

5 The pattern of disease burden will shift from three leading causes of deaths, namely pneumonia, diarrhea, and perinatal conditions in 1990 to heart diseases, depression and road traffic injuries in 2020.

Risk Factors causes Death, Disability and Disease

From table 1.4 the top listing of risk factors leading to disease (Ezzati 2002) it is quite apparent that behavior play a major role in causation of disease. Behavior change is not only required at individual level but at family, community and country level. Hunger leading to malnutrition is based on international and national political decisions. For example the decision to construct a dam that serve the electricity needs of agribusiness, industry, and the elite but that inundate farmland of the poor, exacerbating poverty and hunger (Tracy Kidder 2003). Discrimination at family and community level may cause hinderance in implementation of nutrition program. Taboos associated with nutrition may lead to anemia in pregnancy related to under eating or restricted eating. Whether it is tobacco or alcohol use, or unsafe sex many of the causes of disease are behavioral in nature. But this behavior can be changed (Ruth 2004, Murphy 2005) through appropriate and effective health program.

Health Status of India

The health of a nation is difficult to define in terms of a single set of measures. At best, we can assess the health of the population by taking into account indicators like infant mortality and maternal mortality rates, life expectancy and nutrition, along with the incidence of communicable and noncommunicable diseases. Current indicators of health have improved substantially when they are compared with the indicators during 1951 and 2011 (Table 1.7). According to these measures, the health of the Indian population has improved significantly over the past sixty years. Life expectancy has risen from 33 years to 64 years. The infant mortality rate (IMR) has fallen from 134 to 44 per 1000. The crude birth rate (CBR) has declined from 40 to 22.5 and the crude death rate (CDR) has fallen from 27 to 7.3 (RGI). The couple protection rate (CPR) and total fertility rate (TFR) have also improved substantially. Causes of deaths and DALYs losses are grouped in three categories according to their severity: 1) communicable diseases including perinatal, nutritional & maternal causes. 2) Non-communicable diseases. 3) Injuries (Table 1.8). Various mortality and morbidity rates differ from one state to another in India. This health inequality has many dimensions: gender, class, caste, geographic, ethnic, sexual (Table 1.9). There are diverse 'pathways' by which health inequality might be created: material deprivation, behavior, health beliefs, access to services. There is clustering of one inequality with another, 'multiple deprivation', arguments over absolute and relative poverty. At root, health inequality is not really a problem of health, or health care, or medicine. It is a problem of inequality in general. It is social inequality-inequality of access to power and resources-which results in health equality, and a whole range of other inequality besides: inequality in education, housing, employment, nutrition, and so on. The problem is the inequality -the difference - between the resources of those at the top and those at the bottom, we not only risk blame them for their predicament, but we also ignore the bigger picture; that we are all suffer from the myriad undesirable effects of a society which is growing ever more unequal.

Despite various achievements in health, wide disparities persist between different income groups, between rural and urban communities, and between different states and even districts within states. The infant mortality rate among the poorest quintile of the population is 2.5 times higher than that among the richest. Maternal mortality remains very high. More than one lakh women die each year due to pregnancy-related complications. Like population growth and economic growth, the health of a nation is a product of many factors and forces that combine and interact with each other. Economic growth, per capita income, employment, levels of literacy and education—especially among females—age of marriage, birth

Table 1.7: Current Status of India

Item of Information	1951	1991	2001	2013	2015
Population (Total in million)	361.09	846.42	1028.61	1237	1296
% of the world			16.7	17.6	
Male	185.53	439.36	532.16	633.7	
Female	175.56	407.06	496.46	586.4	
States & Union Territories	-	25 + 7	28 + 7	29+7	
Age distribution (%)					
0-4 yrs	-	10.74		9.7	
5-9 yrs	-	12.47		9.1	
10-19	-	21.88		20.2	
15-44	-	46.08		49.7	
15-59 yrs	-	53.9	55.5	62.6	
60+	-	6.5	7.3 (2006)	8.3 (2012)	
Scheduled Caste population to Total (%)	-	15.75	16.48		
Scheduled Tribe population to Total (%)	-	7.76	8.08		
Decennial Growth Rate (%)	13.31	23.87	21.52	17.7	
Annual Growth Rate (%)	2.19	2.07	1.96		
Sex Ratio (Females/1000 males)	946	926	933	940	
Sex Ratio child 0-6 year		945	927	912	
Density of Population (per sq Kms)	117	267	325	382	
% of Urban Population	17.29	25.70	27.82		
No. of Districts	-	466	642		
No. of Towns	-	4615	5161		
No. of Villages	-	580781	638588		
Effective Literacy Rate in >7 yrs (%) Total	18.33	52.20	65.49	74	
Male	27.16	64.13	75.96	82.14	
Female	8.86	39.28	54.28	65.46	
Population Below Poverty line (%) Total	54.9 (73-74)	36.0 (93-94)	25.9		
Rural	56.4	37.3	27.0		
Urban	49.0	32.4	23.5		
Poverty Line (Food and nonfood expenditure)					
Rural (Rs. per capita per month)	-	205.84	356.30	781	
Urban (Rs. per capita per month)	-	281.35	538.60	965	
Crude Birth Rate (per 1000 population)	39.9	29.5	23.1 (2008)	21.6	21.4
Crude Death Rate (per 1000 population)	27.4	9.8	7.4 (2008)	7.1	7.0
Natural Growth Rate (per 1000 population)	12.5	19.7	18.0	17.6	
Infant Mortality Rate (per 1000 live births)	134	80	55	42	39.0
Child (0-4 yrs) Mortality Rate	57.3	26.5	17.3	52	
Maternal Mortality Rate (per 1 lakh live births)	-	519 (Unicef)	254	178	167
General Fertility Rate	140.9 (1981)	123.9 (1990)	103.2	80.3	
Total Fertility Rate	6	3.6	2.6	2.4	2.3
Contraceptive Prevalence Rate (%)	10.4	44.1	56.3	54.8	
Expectancy of Life at birth (Yrs) Total (Projected)	31.7	58.6	63.9	66.2 (2012)	67.5
Male	32.0	58.1	62.8	65.2	66
Female	31.4	59.1	64.6	67.7	

continue ....

Item of Information	1951	1981	2001	2015
Life Expectancy Female				68
No. Medical Colleges	30	146	242 (2005-6)	412
No. of Seats				43576
No. Dental Colleges	4	57	205	301
No. of Seats				25320
No. of Colleges of ISM & H				516
Ayurvedic Colleges	144 (1997)	167 (1999)	219 (2005)	261
Unani Colleges	31	37	37	41
Siddha Colleges	2	2	6	9
Homoeopathy	118	116	178	188
No. of Hospitals	2694	6804 (1982)	15393 (2003)	19817
Beds per lakh populations	32	83 (1982)	89 (2003)	-
Beds /10000 population	-	-	7.8	9
Subcenters	17521 (1967)	130984		151684
Primary Health Centers	4793	20139		24448
Community Health Centers	-	2070		5187
Population per doctor Allopathic				1384
Population per AYUSH doctor				1783
Population per dentists				10120.8
No. of AYUSH Doctors			725338	
No. of Nurses ANM			527482 (2007)	726557
No. of Nurses GNM			930526 (2007)	1562186
No of Nurses LHV			51186 (2007)	55498
No. of Pharmacists			681692 (2007)	643301
Economically Active population (% of total)	-	-	39.1 (2002)	
Gross National Product (In Crores)	9506	503409	2812758 (2004-05)	
Per capita Net National Product (Rs)	255	5365	23241 (2004-05)	33731 (2010)
Plan Outlay (Rs in Crores) Total	65.3 (1st Plan)	35204.9 (IX)	58920.3 (X)	300018 (XII)
Health Expenditure as % of GDP	0.22	0.96	0.91	1.1
Health Expenditure in % in India **Public**				26.7
Health Expenditure in % in India **Private**				71.6
Health Expenditure in % in India **External Flow**				1.7

(Sources: NFHS 3, Census 2011, SRS 2013)

rates, availability of information regarding health care and nutrition, access to safe drinking water, public and private health care infrastructure, access to preventive health care and medical care, health insurance, public hygiene, road safety, and environmental pollution are among the factors that contribute directly to the health of the nation.

Communicable diseases such as malaria, kala-azar, tuberculosis and HIV infection remain the major causes of illness in India. During the next five to ten years, existing programs are likely to eliminate polio and leprosy and substantially reduce the prevalence of kala-azar and filariasis. However, TB, malaria and AIDS will continue to remain major public health problems.

Reasons for High Disease Burden in India

1. Poor economy of the country: With more than a quarter of the population living below poverty line, the country has the highest number of people with poverty anywhere in the world. The country accounts for 40 per cent of the world's poor and its social indicators are still poor. At 6.0 per cent of GDP (March, 2004), its fiscal deficit is one of

Table 1.8: Disease Morbidity in India

I. Communicable disseases						
ARI		Cases	26152957	23379578	-	26300203
31738762						
Penumonia	Cases	681560	660390	-		703532
Tuberculosis	Cases	-	-	615977	1323949	928190 (4%)
Acute Diarrhea	Cases	10213917	9478813	-	10231049	1076506
Cholera				2680		1127
Viral Hepatitis	Cases					104145
Whooping cough	Cases	30088	40729	-	35217	36661
Diphtheria	Cases	2834	3354	6081	3485	4090
Tetanus	Cases	2815	7005	3714	4493	3304
Neonatal Tetanus	Cases	625	937	811	653	528
Measles	Cases	64185	26900	48181	29339	15768
Typhoid	Cases	789004	694862	-		1537118
Meningitis	Cases	3438	4472			
Leprosy	Cases	-		134184	127295	86261
JE	Cases	-	-	294	8247	1078
Malaria	Cases	-	-	95734579	1310367	836916
Dengue	Cases					74168
II Non-communicable conditions						
Coronary Heart Diseases (All age)		27040912	35886789			61522345
Diabetes mellitus (All age groups)		25814117	31039932			45809149
Cancers (All age groups); No/lakh popu-			110			
35-64 Yrs; No/100,000 pop		-	227			
III Injuries						
Natural		36651 (2001)	21502 (2006)			22960
Unnatural		234368 (2001)	293202 (2006)			372022

(Source: CBHI 2008 World health statistics 2010)

the highest in the world.

2. Maldistribution of country resources.
3. Poor governance and management to utilize resources appropriately.
4. Poor people participation.
5. Poor level of literacy of people.
6. Geographical characteristics of the country favorable for certain diseases like malaria, filaria, etc.
7. Poor political commitment.
8. Poor comprehensive and integrated policy on health.
9. Poor scientific development in the field of molecular science, vaccine development, newer drugs, evidence based medicine and public health, etc.
10. Poor awareness about various national programs and guidelines among practicing doctors.
11. Religious belief system and cultural practices of the population.
12. *Confused Eradication/Elimination strategy:* India is accepting strategies as such which are suitable for developed nations. Eradication (of diseases) is the termination of all transmission of infection by extermination of the infectious agent through surveillance and containment (Kishore

Table 1.9: Statewise distribution of various indicators of health, environment and social development

Andaman & Nicobar	379944	36829	1.0	16.3	4.1	27	-	66.8	42.3	86.3
Andhra Pradesh	84665533	29582	9.2	17.5	7.5	43	38	76.9	18.1	67.7
Arunachal Pradesh	1382611	25639	34.6	19.2	6.6	30	36	73.7	47.3	66.9
Assam	31169272	20166	31.9	22.4	7.2	49	36	56.8	59.6	73.2
Bihar	103804637	9702	33.7	25.9	6.2	42	54	86.1	13.9	63.8
Chandigarh	1054686	86629	21.8	14.3	4.0	23	-	99.9	68.5	86.4
Chhattishgarh	25540196	24647	39.9	23.4	7.7	43	-	66.2	5.2	71.0
Dadra & Nagar Haveli	342852	36829	39.3	25.6	4.2	26	-	70.5	17.3	77.6
Daman & Diu	242911	NA	4.4	17.3	4.6	18	-	94.9	32.0	87.1
Delhi	16753235	66728	9.9	16.8	3.8	20	35	90.1	62.9	86.3
Goa	1457723	79351	5.1	13.5	6.7	11	29	58.3	48.2	87.4
Gujarat	60383628	37532	16.6	20.6	6.2	35	45	76.9	21.7	79.3
Haryana	25353081	49038	11.2	21.8	6.5	44	35	81.1	28.7	76.6
Himanchal Pradesh	6856509	36657	8.1	16.4	6.7	32	44	87.5	27.7	83.8
Jammu & Kashmir	125489261	22426	10.3	17.8	5.3	41	35	54.9	41.8	68.7
Jharkhand	32966238	18423	36.9	23.8	5.9	34	-	35.5	6.6	67.6
Karnataka	61130704	28830	20.9	18.8	7.1	35	44	80.5	17.4	75.7
Kerala	33387677	33609	7.0	15.2	7.0	12	37	16.9	81.3	93.9
Lakshadweep	64429	NA	3.7	14.0	6.1	20	-	4.6	93.1	92.3
Madhya Pradesh	72597765	16578	31.6	25.7	7.8	52	55	61.5	8.9	70.6
Maharashtra	112372972	41331	17.3	16.7	6.3	25	50	68.4	18.2	82.9
Manipur	2721755	18393	36.9	15.6	4.3	11	28	29.3	77.5	79.8
Meghalaya	2964007	24766	11.9	24.1	7.5	46	38	29.5	40.1	75.5
Mizoram	1091014	25679	20.4	17.6	4.5	36	28	23.8	79.7	91.6
Nagaland	1980602	21083	18.9	15.3	3.1	14	24	47.5	64.6	80.1
Orissa	41947358	20240	32.6	19.4	7.9	57	49	62.9	7.7	73.4
Pudicherry	1244464	52669	9.7	14.6	6.6	14	-	96.6	21.4	86.6
Punjab	27704236	40566	8.3	16.2	6.5	30	29	96.9	40.9	76.7
Rajasthan	68621012	20492	14.7	25.0	6.4	46	51	60.4	14.6	67.1
Sikkim	607688	29788	8.2	18.1	5.1	19	21	67	59.4	82.2
Tamil Nadu	72138958	32733	11.3	15.9	7.4	22	27	85.3	14.4	80.3
Tripura	3671032	27777	14.0	14.9	4.7	21	-	45	77.9	87.7
Uttar Pradesh	199581477	14649	24.4	27.0	7.4	48	52	85.5	19.2	69.7
Uttrakhand	10116752	27800	11.3	18.2	6.0	33	-	83	31.6	77.1
West Bangal	91347736	28753	19.9	16.3	6.2	32	49	87	26.9	77.1
India	**1210193422**	**29642**	**21.9**	**21.4**	**7.0**	**39**	**47**	**73.2**	**21.9**	**74.04**

(Source: Oct 2008 RGI, Census 2011)

2013). Eradication, as in the instance of smallpox, was based on the joint activities of control and surveillance. According to WHO Eradication is an achievement of a status whereby no further cases of a disease occur anywhere, and continued control measures are unnecessary. *Elimination* is reduction of case transmission to a predetermined very low level; e.g., elimination of tuberculosis as a public health problem was defined by the WHO as reduction of prevalence to a level below one per million population. There are only few diseases such as small pox and guinea warm infestation, India is able to eradicate but a significant amount of funds were consumed in these eradication programs. With the similar pattern many more diseases are lined up in national and international programs that demands huge resources that could have been used for other priority areas. For selecting the disease for elimination or eradication standard criteria (Dowdle WR 1998) should be applied as given below:

Criteria for Disease Eradication

A. Biological and technical feasibility

- National history of biological agent
- Non-human reservior
- Effective tool
- Effective delivery strategy
- Simple and practical diagnosis

- Sensitive surveillance
- Field Proven strategy

B. Cost and Benefit
- Case averted per year
- Coincident benefits
- Intangible benefits
- Estimated annual direct global savings
- Estimated total external financing

C. Social and Political Consideration
- Political commitment
- Social support
- Disease burden in political unstable areas
- Core partnership and advocates
- Technical consensus
- Donor base

HEALTH VISION 2020 INDIA

India Vision 2020 was initially a document prepared by Technical information, Forcasting and Assessment Council (TIFAC) under the chairmanship of Dr.A.P.J.Abdul Kalam and a team of 500 experts. Dr.Kalam further gave shape to this concept through his seminal work along with Dr.Y.S.Rajan – " India 2020 : Vision for the new millennium".

"India 2020" is "Transforming the nation into a developed country", for which five areas in combination have been identified based on India's core competence, natural resources and talented manpower for integrated action to double the growth rate of GDP and realize the Vision of Developed India. These are:

Agriculture and food processing — with a target of doubling the present production of food and agricultural products by 2020. Agro food processing industry would lead to the prosperity of rural people, food security and speed up the economic growth;
Infrastructure with reliable and quality electric power including solar farming for all parts of the country, providing urban amenities in rural areas and interlinking of rivers;
Education and Healthcare: To provide social security and eradication of illiteracy and *health for all*;

Information and Communication Technology: This is one of the core competencies and wealth generator. ICT can be used for tele-education, tele-medicine and e-governance to promote education in remote areas, healthcare and also transparency in the administration; and

Critical technologies and strategic industries witnessed the growth in nuclear technology, space technology and defence technology"

Health for All

Improved diagnostic services and treatment can reduce the prevalence and incidence of TB by 2020. About 2 million cases of malaria are reported in India each year. Restructuring the "malaria workforce" and strengthening health infrastructure can reduce the incidence of this disease up to 50 per cent within a decade.

Childhood diarrhea, another major cause of illness, is largely preventable through simple community action and public education, and deaths due to diarrhea can be eliminated by 2010. Given the projected improvement in living standards, food security, educational levels and access to health care among all levels of the general population, substantial progress can be made in reducing the prevalence of severe undernutrition in children by 2020.

Greater emphasis on education and enforcement of road safety rules by both drivers and pedestrians is an urgent need of the hour.

As already noted, there will be a massive increase in population in the 15-64 age group. Reproductive and Child Health care programs must meet the needs of this rapidly growing clientele. The population in this age group will be more literate and have greater access to information. They will have greater awareness and expectations about access to quality services for maternal and child health, contraceptive care, management of gynecological problems, etc.

A major focus of vision 2020 must be on improving access to health services to meet the health care needs of women and children. India's significant achievements in the field of health have been made possible by the establishment of a huge rural health infrastructure, along with the formation of a massive health care manpower.

Development plans for India's health care systems need to place greater emphasis on public health education and prevention. The wide dissemination of health and nutrition related information through traditional channels should be supplemented by an ambitious and persistent program of public health education through the print, television, radio and electronic media.

The insurable population in India has been assessed at 250 million and this number will increase rapidly in the coming two decades. This should be supplemented by innovative insurance products and programs by panchayats with reinsurance backup by companies and government to extend coverage to much larger sections of the population.

The life expectancy of the Indian population is expected to reach above 70 years in 2020, which compares favorably with the Upper Medium Income (UMI) countries reference level of 69 years. Mortality rates for infants are expected to decline to less than 20 per 1000 in 2020, which compares favorably with the UMI reference level of 22.5.

HEALTH ACTION AT THE NATIONAL LEVEL

National health programing in India is perfectly matching with the percentage of DALYs lost due to specific cause on priority basis. India has major programs for the control of infectious diseases like Malaria, Tuberculosis, HIV & AIDS, STDs, kala-azar, filariasis, Vaccine Preventable Diseases, ARI, National Water and Sanitation Program, etc., and Programs for control of maternal disorders, perinatal and child morbidity like MCH progam (now is known as Reproductive and Child Halth Program). For nutritional deficiencies India has National Iodine Deficiency Disorders Control Program, Vit-A Prophylaxis, Anemia Control Program, ICDS, Mid-day meal, etc. More emphasis is given to group 1 diseases that include communicable diseases, perinatal and nutritional disorders because these are contributing maximum percent of DALY loss (Table 1.6).

For group 2 diseases also we have national programs and schemes, for example national control program for cancers, diabetes, and blindness. Recently cardiovascular disease control and oral health program have been initiated on pilot basis. A comprehensive program on noncommunicable diseases is also under consideration. Government has already started an Integrated Disease Surveillance Program in 2004. We need a comprehensive program for prevention of unintentional injuries. Because many noncommunicable diseases have common risk factors, therefore a comprehensive approach to combat those is the need of hour instead of isolated and separate program for each Non-Communicable Disease. We have changed the perception and accepted that health is affected by various social and economic factors that need to be tackled appropriately (Table 1.10).

Table 1.10: Risk factors contributing to the % of DALYs based on 1990 data.

Risk Factor	India	World
Malnutrition	22.4	15.9
Poor Water, Sanitation & Hygiene	9.5	6.8
Unsafe Sex	4.0	3.5
Tobacco	0.6	2.6
Alcohol	1.6	3.5
Occupation	2.0	2.7
Hypertension	0.9	1.4
Physical inactivity	1.0	1.0
Illicit drugs	0.1	0.6
Air pollution	0.5	0.5

Women Empowerment & Child Development

Women and children, who represent more than 2/3rd of the country's total population constitute the most important contributors of total burden of disease and need special attention. Discrimination against women in Indian society could begin as early as conception—in the act of deliberately selecting the sex of child. It also becomes visible in the early childhood, in upbringing of girls vis-'a-vis boys in the family, in terms of nutrition, health care, opportunities for education, skill formation and household work that the girl child is expected to share. This discrimination is also reflected in adverse sex ratio (Kishore 2012). Most of the reasons of mother and child mortality are social, therefore social intervention are suggested.

The Indian Constitution provides comprehensive safeguard for women. These are as follows:

- Equality before the law —Article 14;
- No discrimination by the State on grounds of sex, beside others like religion, race, caste, place of birth or any of these—Article 15 (1);
- Special provision to be made by the state in favor of women and children—Article 15 (3);

- Equality of opportunity for all citizens in matters relating to employment or appointment to any office—Article16;
- Equal right for livelihood and payment for it—Article 39;
- Provision of just and humane condition of work and maternity relief —Article 42;
- Prohibit any practice derogatory to the dignity of women—Article 51 (A) (e).

In addition, Articles 243D(3), 243D(4), 243T(3) and 243T(4) of the Constitution make provision for reserving not less than one-third of the total seats for women in the direct elections to local bodies, viz. Panchayats and Municipalities. Beside this there are number of legislations providing various rights and safeguards to women and children (Please see Part 3 of this Book). It has already been established that women empowerment has wide implication on human growth and development. Five Year plans have expressed various plans for empowerment of women e.g. a) development of National Policy for Empowerment of Women, b) Gender Development Index, c) reservation of seats in parliament and legislative assemblies, d) adopting special strategy of "Women's Component Plan" ensuring 30% funds/ benefits flow to women, e) organizing self help groups, f) prioritizing reproductive and child health, g) easily accessible and equal and free education up to college level, h) eliminating gender bias, and i) increase access to credit through setting up of a "Development Bank for Women". Various programs have been launched by the Government of India for women and child health and development.

Comprehensive Integration of Program

India has convergence of many programs under National Health Mission (RCH, RNTCP, NVBDCP, NACP, NBCP, NLEP, Water and Sanitation Program, National Program, IDSP) to put all programs in mission mode.

Future Health Interventions Approach

Current evidence shows that effective health interventions share common characteristics. They are based on a proper assessment of need and are clearly focused. They are multifaceted; and are developed in conjunction with target communities. Practitioners, policy makers, researchers, and community need to cooperate to ensure that the implementation of intervention has been instituted. For that wider level of education and development effective programs are required (Mac farlain 2000).

Disease Specific Interventions need to be changed into a comprehensive and overall development oriented approach. Disease specific intervention like DOTS, AIDS control Program, National Iodine Deficiency Disorders control Program, etc., even though they may use excellent technique of community intervention, they still may fail to sustain as they require huge resources and political will. While the disease-specific interventions for example, small pox eradication program or guinea-worm eradication program, are widely and justly acclaimed as excellent achievements in public health, having utilized extraordinary skill in community intervention, such programs often do relatively little to develop the infrastructure and the knowledge, skill and commitment needed for other community interventions for health (Wilkinson et al. 1991). That is why, the general health services suffer from these vertical programs. On the other hand if program is integrated in general health services then focus attention is lost (Table 1.2). For these reasons a middle path has to be developed. The RCH Program of India is a huge and comprehensive program for reproductive and child needs of the population. This is an example of integrated program but its success needs to be observed in coming future.

Implementation of some program is limited to their nascent stage such as oral health program, and mental health program, employment schemes, road construction, rehabilitation of victims of disasters. The real beneficiaries are deprived because of the widespread corruption and inefficient administration (Raval 2001). An ethics of seriousness about public services of the government needs to be inculcated in planners and decision makers at all levels.

In the Health Sector following areas need *reform* for better and efficient delivery of services:

1. *Health care financing*

- Financing should be according to health need.
- Risk sharing schemes for informal sectors (Health Insurance).
- Competitive approach.
- Privatization: must ensure equal distribution and

care of underprivileged section of the society.

2. *Reform in provision of health care*

- Vertical approach: good for disease specific intervention, however, it may fail for wide range of services.
- Integrated approach: the WHO adopted Primary Health Care approach for health delivery. The Bhore Committee report identified 5 areas of services-Public health, medical relief, professional education, health research and international health. System reform should focus at least on two cadres of health professional-Clinical and public health and roles of each other should be clearly defined. Each one should establish close relationship in delivering quality health services and also covering medical relief, professional education, health research and international health as discussed. Most of the public health primary care system is inefficiently managed by clinical professionals. Wherever the public health cadre is created the results are much better for example, Tamil Nadu.

3. *Resource generation*

- Human resource development. It should not only focus on health professionals but also health managers who are crucial for managing health workforce.
- Private and international funding is already pouring in capacity building which need to be regulated.

4. *Governance*

- Reorientation and restructuring.
- Decentralization.
- Reforms related with other sectors: One should not look for that what other sectors can do for health rather one must ensure what health sector can do for other sectors.

5. *Strategic*

- Capacity building.
- Promotion of research for health sectors reform.
- Exchange of information and learning by doing.

Financial interventions

Before understanding of financial intervention it is pertinent to know various definitions of health economics (Kishore 2013):

Health Economics is concerned, firstly, with quantifying over time the resources used in health service delivery; secondly, with the efficiency with which those resources are allocated and used for health purposes; and thirdly, with the effects the various health services upon the health and well-being of the population.

Macro Economic is a study of total economic process rather than any one of its parts. It implies the study of the process of production, consumption, and distribution of goods and services for economy as a whole. Phenomena such as employment, or unemployment, inflation or delation, aggregate exports and imports also happen to be macroeconomic in their nature because they relate to the whole economy rather than to one of its parts. *Micro economics* is the study of the consumption, production, and distribution aspects of economic activity which is undertaken by an individual or a firm, or groups of these in so far as these groups do not envelop the whole country. Phenomena such as relative prices of commodities and services, the individual's or the firm's variations in the supply of their output or their demand for goods and services or factors of production are illustrative aspects of the study of microeconomics.

National Income is the sum of incomes accruing within a year to the factors of production supplied by the normal residents of a country, before education of direct taxes, and equals the sum of compensation of employers' income from incorporated enterprises, rent, interest and dividend accruing the households, savings of corporations, and direct taxes on corporations. It is identifiably equal to the net national product at factor cost. The money value of all goods and services earned in the country over a specified time period. It may be calculated as the sum either of incomes or of expenditures of all residents, companies and government bodies. Gross domestic product and gross national product are related measures.

Gross Domestic Product (GDP) is a measure of the total flow of goods and services produced in a country in a year.

Gross National Income per capita: Gross National Income is the sum of value added by all resident producers plus any product taxes (less subsidies) not included in the valuation of output net receipts of primary income (compensation of employees and property) from abroad. GNI per capita is gross national income divided by midyear population.

Health Financing is the provision of funds or credit

for a specified purpose in the health sector. The origin of financing may be external (from abroad) or domestic (private or public).

Net Domestic Product: Net domestic product at market prices is equal to gross national product minus depreciation and minus net factor incomes from aborad. Net domestic product at factor cost is equal to gross national product minus depreciation, minus depreciation, minus the difference between indirect taxes and subsidies to producers.

Public Health spending accounts for less than a quarter of the total health spending in India. However, it plays a major role in terms of planning, regulating and shaping the health care delivery system. Such public provisioning is essential to achieve equity and address the large positive externalities associated with health.

Around 24% of all people hospitalized in India in a single year fall below the poverty line due to hospitalization. An analysis of financing of hospitalization shows that large proportion of people; especially those in the bottom four income quintiles borrow money or sell assets to pay for hospitalization (World Bank, 2002). This situation exists in a scenario where health care is financed through general tax revenue, community financing, out of pocket payment and social and private health insurance schemes. India spends about 4.9% of GDP on health (WHR, 2002, NCMH 2005). The per capita total expenditure on health in India is US$ 23, of which the per capita Government expenditure on health is US$ 4. Hence, it is seen that the total health expenditure is 4.9 % of GDP, with breakdown of public expenditure (0.9%); private expenditure (4.0%). The private expenditure can be further classified as out-of-pocket (OOP) expenditure (3.6%) and employees/community financing (0.4%). It is thus evident that public health investment has been comparatively low.

Public spending (central and state governments) on health gradually accelerated from 0.22% in 1950 to 1.05 in mid-1980s, and stagnated at around 0.9% of the GDP during the later years (Table 1.10). Furthermore, the central budgetary allocation for health (as a percentage of the total central budget) has been stagnant at 1.3% while in the states it has declined from 7.0% to 5.5%. In light of the fiscal crisis facing the government at both central and state levels, in the form of shrinking public health budgets, escalating health care costs coupled with demand for health-care services, and lack of easy access of people from the low-income group to quality health care, health insurance is emerging as an alternative mechanism for financing of health care.

Some people advocate that user charges could be a solution but it was found that access of poor people fell particularly for indoor services. Levying user charges are also associated with decrease in budgetary allocation from the state which does not improve the services. For more resources other methods should be adopted such as improving quality and accountability of services which would definitely improve investment in health from general public and corporate sector.

Health Insurance

A. Formal Sector (12%)
   - ESIS, CGHS etc. (10%)
   - Mediclaim and other similar schemes (2%)

B. Informal Sector (1.1%)
   - Community Based Schemes
   - Government Sponsored/ Subsidised Schemes

The health insurance market in India is very limited covering about 13% of the total population. The existing schemes can be categorized as:

(1) Voluntary health insurance schemes or private-for-profit schemes: In the public sector, the General Insurance Corporation (GIC) and its four subsidiary companies (National Insurance Corporation, New India Assurance Company, Oriental Insurance Company and United Insurance Company) and the Life Insurance Corporation (LIC) of India provide voluntary insurance schemes. Currently, a few companies such as Bajaj Alliance, ICICI, Royal Sundaram, and Cholamandalam among others are offering health insurance schemes.

(2) Employer-based schemes: The railways, defence and security forces, plantations sector and mining sector provide medical services and / or benefits to its own employees.

(3) Insurance offered by NGOs / community based health insurance: Some examples of community-based health insurance schemes are Self Employed Women's Association (SEWA) and AMUL Dairy Cooperatives in Gujarat; The Mallur Milk Cooperative

Table 1.11: Trends in health expenditure in India from 1950-2004

1950-51	0.22	NA	0.22	0.61
1955-56	0.49	NA	0.49	1.37
1960-61	0.63	NA	0.63	2.48
1965-66	0.61	NA	0.61	3.47
1970-71	0.74	NA	0.74	6.22
1975-76	0.73	0.08	0.81	12.16
1980-81	0.83	0.09	0.92	19.37
1985-86	0.96	0.09	1.05	38.64
1990-91	0.89	0.06	0.95	64.83
1995-96	0.82	0.06	0.88	122.08
2000-01	0.86	0.04	0.90	184.56
2001-02	0.79	0.04	0.83	189.56
2002-03	0.82	0.04	0.86	202.22
2003-04	0.86	0.06	0.91	214.62

GDP is at market price, with base year 1993-94

in Karnataka; Action for Community Organization, Rehabilitation and Development (ACCORD) Nilgiris, Kadamalai Kalanjia Vattara Sangam (KKVS) Madurai, Voluntary Health Services (VHS) Chennai in Tamil Nadu; and Raigarh Ambikapur Health Association (RAHA) in Chhatisgarh.

(4) Mandatory health insurance schemes or government run schemes: The government-run schemes include the Central Government Health Scheme (CGHS) and the Employees State Insurance Scheme (ESIS).

Apart from the government-run schemes, social security benefits for the disadvantaged groups can be availed of, under the provisions of the Maternity Benefit (Amendment) Act 1995, Workmen's Compensation (Amendment) Act 1984, Plantation Labour Act 1951, Mines Labour Welfare Fund Act 1946, *Beedi* Workers Welfare Fund Act 1976 and Building and other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996.

Rashtriya Swasthaya Bima Yojna (RSBY): is a Central government health insurance scheme for the Below Poverty Line (BPL) families in the unorganized sector and near-poor groups such as domestic, construction, and beedi industry workers, rickshaw pullers, and taxi drivers have been recently brought under the purview of RSBY, and the scheme is being pilot-tested for outpatient coverage. It was formally launched on October 1, 2007 (Govt of India 2015). The majority of the financing, about 75 per cent, is provided by the Government of India (75% of the annual premium of Rs. 750, subject to a maximum of Rs. 565 per family), while the remainder is paid by the state government (25%). The registration fee of Rs.30 is collected from the beneficiary by the insurance company and adjusted against the payment of premium to be made to the insurance company by the State Government.

Benefits:

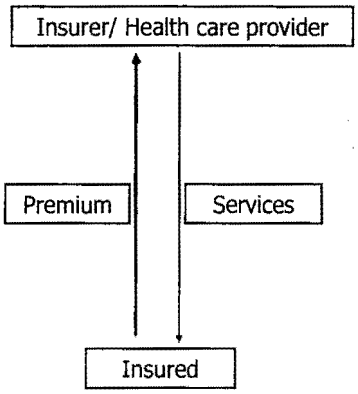
1. Hospitalization expenses up to Rs. 30,000;
2. Over 725 pre-defined surgical packages;
3. Maternity newborn care;
4. Day care services;
5. Cover all pre-existing diseases;
6. 1 day pre and 5 days hospitalization expenses;
7. Transportation costs (Rs. 100 per visit) with overall limit of Rs. 1000 per year.

The common exclusions include:

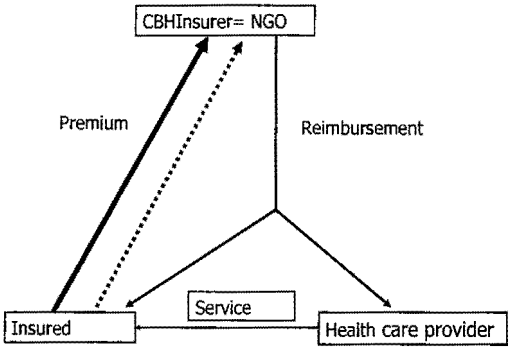
- Conditions that do not require hospitalization
- Congenital external diseases
- Drug and Alcohol Induced illness
- Sterilization and Fertility related procedures
- Vaccination
- War, Nuclear invasion
- Suicide
- Naturopathy, Unani, Siddha, Ayurveda

RSBY is India's ambitious hospital insurance

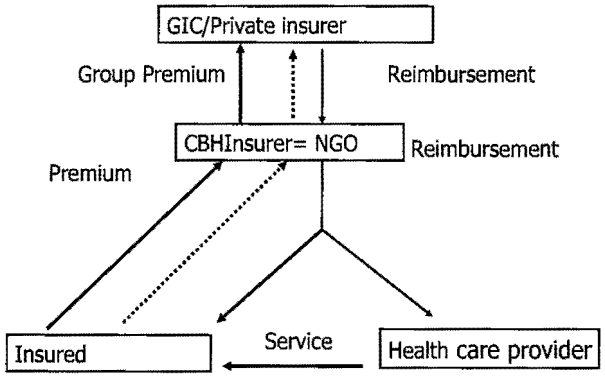
Provider owned scheme



2. NGO Owned Scheme



3. NGO Intermediated Scheme



programme, but the evidence on its intended effects remains inconclusive. Further research particularly comparitive trial is required before the programme's merit can be judged. Rigorous impact evaluation of RSBY will not only capture the real impact of the scheme, but may also be able to estimate the extent of systemic inefficiencies at the level of the consumer. The potential for RSBY or an RSBY-like scheme is enormous as the need to improve health outcomes and decrease financial shocks is great.

Challenges

Currently, there are no mechanism or infrastructure for collecting mandatory premium in the large informal sector. Even in terms of the existing schemes, there is insufficient and inadequate information about the various schemes. Data gaps also prevail. Much of the focus of the existing schemes is on hospital expenses. There continues to be lack of awareness among people about health insurance. In spite of existing regulation in some States, the private sector continues to operate in an almost unhindered manner. The growth of health insurance increases the need for licensing and regulating private health providers and developing specific criteria to decide upon appropriate services and fees.

Health insurance per se, suffers from problems like adverse selection, moral hazard, cream-skimming and high administrative costs. This is coupled with the fact that in the absence of any costing mechanisms, there is difficulty in calculating the premium. There is also a need to evolve criteria to be used for deciding upon target groups, who would avail of the SHI scheme/s and also to address issues relating to whether indirect costs would be included in health insurance. Health insurance can improve access to good quality health care only if it is able to provide for health care institutions with adequate facilities and skilled personnel at affordable cost.

Given this scenario, the challenge, then, for Indian policy-makers is to find ways to improve upon the existing situation in the health sector and to make equitable, affordable and quality health care accessible to the population, especially for the poor and the vulnerable sections of the society. It is in a way inevitable that the state reforms its public health delivery system and explores other social security options like health insurance. Implementing regulations would be one, but by no means the best mechanism to contain provider behavior and costs. This can only be done by developing mechanisms where government and households can together pool their funds. This could be one way of controlling provider behavior.

There is an urgent need to document global and Indian experiences in social health insurance. Different financing options would need to be developed for different target groups. The wide differentials in the

demographic, epidemiological status and the delivery capacity of health systems are a serious constraint to a nationally mandated health insurance system. Given the heterogeneity of different regions in India and the regional specifications, one would need to undertake pilot projects to gather more information about the population to be targeted under an insurance scheme and develop options for different population groups. Health policy-makers and health systems research institutions, in collaboration with economic policy study institutes, need to gather information about the prevailing disease burden at various geographical regions; to develop standard treatment guidelines, to undertake costing of health services for evolving benefit packages to determine the premium to be levied and subsidies to be given; and to map health care facilities available and the institutional mechanisms which need to be in place, for implementing health insurance schemes. Skill building for the personnel involved, and capacity-building of all the stakeholders involved, would be a critical component for ensuring the success of any health insurance program.

The success of any social insurance scheme would depend on its design, the implementation and monitoring mechanisms which would be set in place and it would also call for restructuring and reforming the health system, and developing the necessary prerequisites to ensure its success.

In one study at Bangalore it was found that one third of the houses were aware of health insurance but only 22% had health insurance coverage. The coverage was not for all family members. The subscription depended on education, SES and type of family. The willingness to pay a premium was Rs. 500 per year in 31% of the families. Barriers were low income, uncertainity of income, no reliability on company, not taken by friends and relatives, prefer to invest somewhere else, no adequate knowledge and do not feel the need (Madhukumar S et al 2012).

Social Interventions (KERALA MODEL)

Prerequisites for health are peace, shelter, education, food, income, a stable ecosystem, sustainability, social justice, and equity. Improvement of health requires a secure foundation in these basic prerequisites. Our health results not just from how much we have, but from how much we have in relation to how much everyone else has. Health and well-being are affected by aspects of our collective social life-crime, antisocial behavior, respect, or trust-which themselves depend upon how equal or unequal a society we inhabit.

Best example of strong association of social intervention and promotion of health is **Kerala (Kerala Model)**. In spite of low per capita income as compared to national average of India, Kerala achieved almost all targets of international standards. The state has achieved lowest infant mortality rate and maternal mortality ratio and longest life expectancy well before some of the rich countries in the world. These exemplary health statistics are related to the utilization of three key development strategies: 1) Income redistribution by land reform and implementing social security law for agriculture workers; 2) extension of public education vertically by providing free education and spending higher percentage (85%) of education budget on primary education up to 12th standard, because of this there is nonexistence of illiteracy in 5-15 years age group in Kerala and focusing more on female literacy and 3) Policy of active encouragement of population participation in health promotion. Kerala has highest number of health services beds per 100,000 population in the country (Wilkinson 1991). The country should adopt the policy that is adopted by state like Kerala to achieve the best results.

Priority for Health System Research and Innovation

The priority has been given to healthcare system research for improving service delivery and coverage as well as operational research aimed at improving access to technological advances. Basic and clinical research leading to development of products, drugs, vaccines for prevention, diagnosis and management of illnesses especially major health problems for which currently there is no effective cure, are encouraged (Figure 1.1). As Figure 1 shows, healthcare organizations serve six distinct purposes – treatment, diagnosis, prevention, education, research and outreach. In serving these purposes, healthcare organizations must effectively manage quality, costs, safety, efficiency and outcomes. At the very core of healthcare innovation are the needs of patients and the healthcare practitioners and providers who deliver care. Quite often, healthcare organizations arrive at innovation by relying on new or existing information technology. When successful, healthcare innovation

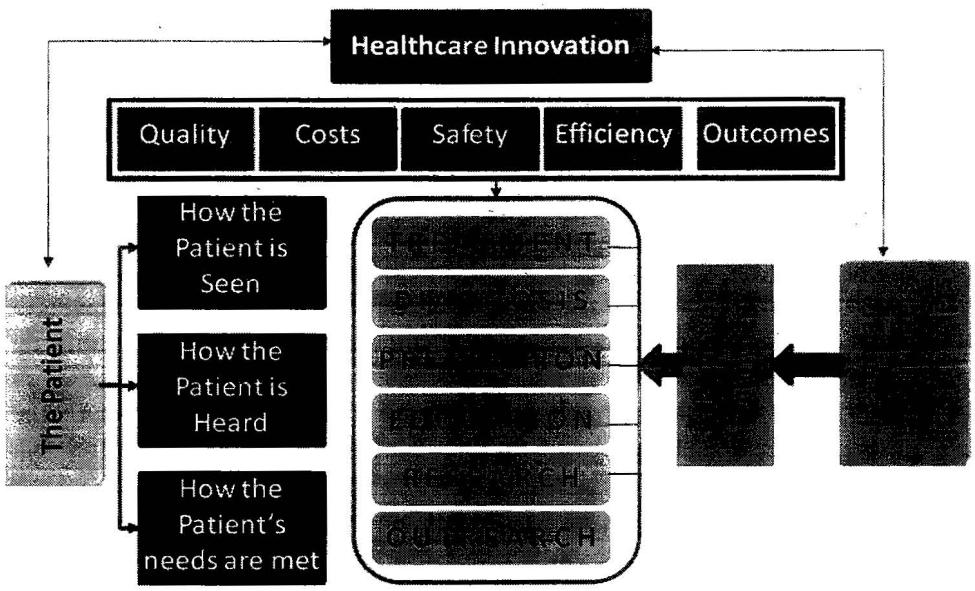


Figure 1.2

focuses on three areas the most – a) how the patient is seen, b) how the patient is heard, and c) how the patient's needs are met (Omachonu 2010).

Efforts to generate data on the health impact of the socioeconomic, demographic and epidemiological transition are required. Health system research should enable the existing systems to provide appropriate health care using effective, inexpensive technology for detection and management of health problems and ensuring equitable, economical, and efficient service delivery, will receive priority. Research has been a crucial part to play in stregthening health systems and in improving the equitable distribution of quality health services for populations in need. There are three domains of research-operational, implemetation and health system. To improve the health care delivery to poor all three domains are required (Figure 1.2)

Community Involvement

There was acute shortage of food at the time of independence. Famines were common. But in seventies the green revolution changed the whole scenario. It was people movement with little involvement of government. Such revolution didn't take place in health field. Community involvement is must for health to reach in every home.

Public Health

For improving health status of people, public health need to be strengthened. In this endeavor the most important is human resource development. A public health professional is a person educated in public health or a related discipline who is employed to improve health through a population focus. Many institutional settings play important roles in public health professional education including schools of public health, degree granting programs in public health, medical schools, schools of nursing, other professional schools (e.g., law), and local, state and federal public health agencies. It is important that the education provided by these programs and institutions is based

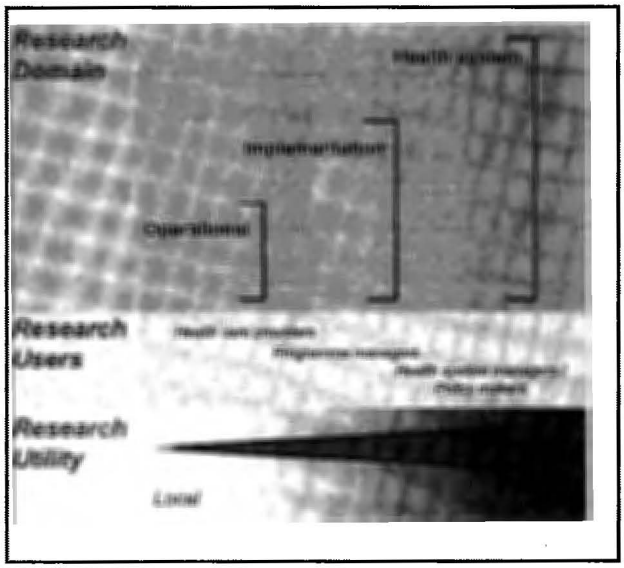


Figure 1.3: Domains of health system research

upon an ecological model of health. An ecological model assumes that health and well being are affected by interaction among the multiple determinants of health. Further, it is important that public health professional education include not only the long recognized five core components of public health (i.e., epidemiology, biostatistics, environmental health, health services administration, and social and behavioral science), but that it also encompass eight critical new areas: informatics, genomics, communication, cultural competence, community-based participatory research, policy and law, global health, and ethics. Understanding and being able to apply information and computer science technology to public health practice and learning (i.e., public health informatics) are necessary competencies for public health professionals in this information age in which we are vitally dependent upon data. Genomics is helping us understand the role of genetic factors in leading causes of morbidity in the country, information that public health professionals must be familiar with to improve health.

Public health professionals must be proficient in communication to interact effectively with multiple audiences. They must also be able to understand and incorporate the needs and perspectives of culturally diverse communities in public health interventions and research, and to understand and be able to influence the policies, laws, and regulations that affect health. New approaches to research that involve practitioners, researchers, and the community in joint efforts to improve health are becoming necessary as we recognize the importance of multiple determinants of health, for example, social relationships, living conditions, neighborhoods, and communities.

Understanding global health issues is increasingly important as public health professionals are called upon to address problems that transcend national boundaries. Finally, public health professionals must be able to identify and address the numerous ethical issues that arise in public health practice and research. We need high quality public health professionals contributing through practice, teaching, and research to improve health in our communities. We must have separate legislation that provides a framework and recommendations for strengthening public health education, research, and practice skills that can be used by the institutions and organizations responsible for educating public health professionals and supporting public health education. Public health professionals' education and preparedness should be of concern to everyone, for it is well-educated public health professionals who will be able to effectively shape the programs and policies needed to improve population health during the coming century. If we want high quality public health professionals, then we must be willing to provide the support necessary to educate those professionals.

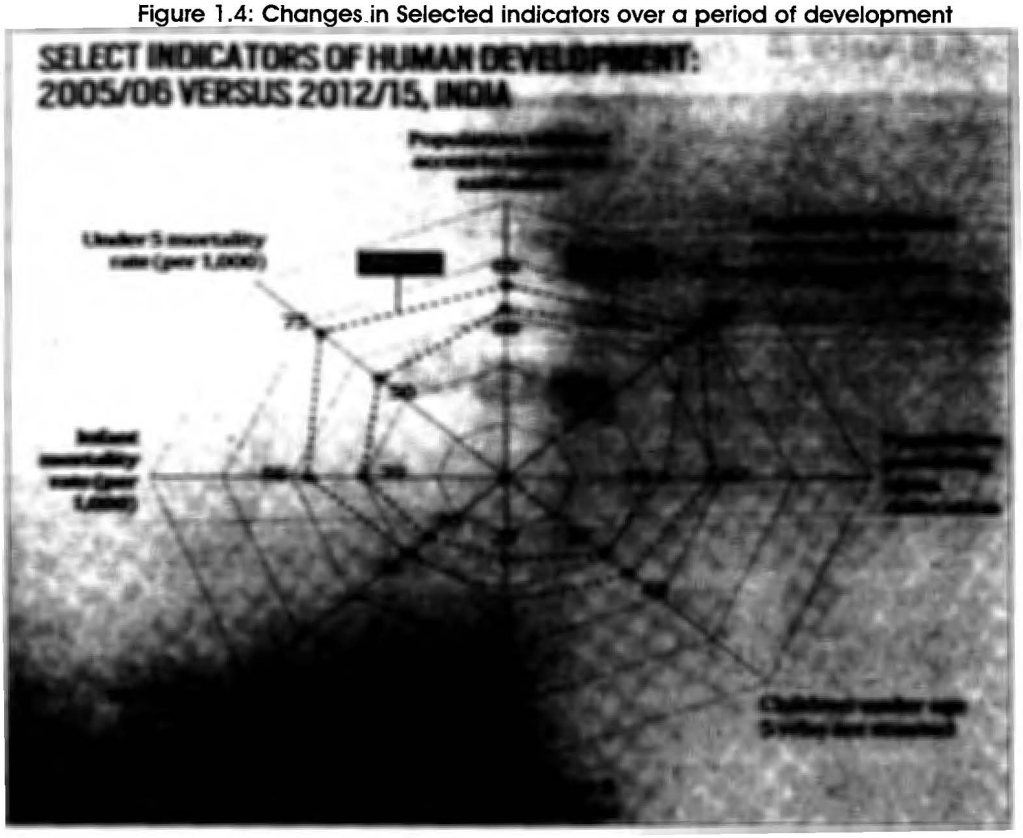
Evidence Based Public Health Interventions

To improve public health, only evidence based intervention should be instituted. However, it is diffi cult to put evidence based public health into action, because the transfer of this knowledge often faces signifi cant challenges such as poor political will, short term agenda of political party due to their 5 year tenure, ill informed and mis-fit decision makers and public health administrators, rigid mindset of organizations, poor involvement of community, error in accepting evidence through randomized control trials, etc. Interventions based on randomized controlled trials (RCTs) are rarely useful in public health practice, as the focus of public health is on a population and not the individuals. Therefore, the external validity (generalization of results) of RCTs is generally poor.

When public health practice is based on emotive or uninformed decision-making, there are consequences such as poor health outcomes, wastage of resources, and decreased workforce productivity. There is a high opportunity cost for society when uninformed interventions are implemented. There exists a solid evidence base generated by high-quality systematic reviews, but the evidence based interventions are either not taken into consideration during policy-making or not implemented as intended due to many barriers. Evidence based public health practice not only brings direct benefits to the population's health, but also expands the evidence base with what works, ensures effi cient use of resources, and brings success in health programs. EBPH practice should integrate the best available evidence with practitioner skills, available resources, community preferences, and the context for successful transfer of evidence-based knowledge into policy as well as practice (Singh KK et al 2015).

From the figure 1.3 through radar graph it is clear that

Figure 1.4: Changes in Selected indicators over a period of development



some indicators are improving but others still need more efforts to decrease them. We can always focus on indicators which are covering more areas under the radar graph keeping watch on smaller areas.

References

Akin J, et al. (1987). Financing health services in developing countries: an agenda for reform. Washington, World Bank.

Arrow K, (1963). Uncertainty and the welfare economics of medical care. American Economic Review 53:141-73.

Bassett M et al. (1997). Professionalism, satisfaction and quality of health care: experience during Zimbabwe's adjustment program. Social Science and Medicine 45; 12:1845-1852.

Black R, Morris S, Bryce J (2003). Where and why are 10 million children dying each year? Lancet 361: 2226-34.

Bloom G (1991). Managing health sector development; markers and institutional reform. In: Colclough C and Manor J, eds. States or markets: neoliberalism and the development policy debate. Oxford University Press.

Chen S, et al. How have the world's poorest fared since the early 1980s? World Bank Research Observer 2004; 19: 141-69.

Devereaux P et al. (2002) Comparison of mortality between private for-profit and private not-for hemdialysis center: a systematic review and meta-analysis. JAMA288:2449-57.

Dowdle WR. The principles of disease elimination and eradication. Bull WHO 1998; 76: 22-6.

Evans R (1997). Health care reform: who's selling the market, and why? Journal of public Health Medicine 19:45-9.

Ezzati M et al. "elected major risk factors and global and regional burden of Disease". The Lancet 2002; 360 No. 9343" 1347-60.

Fan, Shenggen and Polman, Paul. 2014. An ambitious development goal: Ending hunger and undernutrition by 2025. In 2013 Global food policy report. Eds. Marble, Andrew and Fritschel, Heidi. Chapter 2. Pp 15-28. Washington, D.C.: International Food Policy Research Institute (IFPRI).

Franco A, Alvarez- Dardet C, Ruiz M (2005). Effect of democracy on health: ecological study. BMJ 329:1421-3.

Fu W (1999). Health care for China's rural poor. Washington, World Bank.

Global Forum for Health Research. The 10/90 Report on Health Research 1999. GFHR-WHO, Geneva, Switzerland.

Global Burden of Disease study. Lancet 1997; 349:1498-1504.

Global Polio Eradication Initiative [internet site]. Available from: http://www. polioeradication.org [accessed on 2 June 2009].

Govt. of India. Census of India 2011. Registrar General of India, Govt. of India 2011.

Government of India. RSBY official web portal. Available from: *www.rsby.gov.in*, accessed on October 28, 2015.

Gwatkin D (2003). Free government health service: are they the best way reach the poor?

Henry S. Shryock and Jacob S. Siegel, Methods and Materials of Demography (New York: Academic Press, 1976).

Hilgartner S, Bosk CL. The rise and fall of social problems: a public arenas model. *Am J Sociol* 1988;94:53-78.
Himmelstein D et al. (1999). Quality of care in investor- owned vs not-for-profit HMOs journal of the Ame4rican Medical Association 282:159-63.
Hilary J (2001). The wrong Model; GATS, trade liberalization and children's right to health. London, save the Children (UK)
IFC (2002). Investing in private health care: Strategic directions for IFC. Washington DC, International Finance Corporation.
Khagram S, Riker JV, Sikkink K. From Santiago to Seattle: transnational advocacy groups restructuring world politics. In: Khagram S, Riker JV, Sikkink, K, editors. *Restructuring world politics: transnational social movements, networks, and norms*. Minneapolis, MN: University of Minnesota Press; 2002. pp. 3-23.
Kishore J. The Vanishing Girl Child. New Delhi: Century Publications 2005.
Kishore J. A Dictionary of Public Health. 3rd Edition. New Delhi: Century Publications 2013.
Koppaka R. Epidemiology and Analysis Program Office, Office of Surveillance, Epidemiology, and Laboratory Svcs, CDC; Weekly; June 24, 2011 / 60(24);814-818.
Liu X, Mills A (2002). Financing reforms of public health services in china: lessons for other nations. Social Science and Medicine 54:1691-8.
Lopez AD, et al. Global and regional burden of disease and risk factors, 2001: systematic analysis of population health data. *Lancet* 2006;367:1747-57.
Mac farlaine S, Racelis M, Muli Musiime F. Public Health in Developing countries. Lancet 2000; 356:841-6.
Madhukumar S, et al. Awareness and perception regaarding health insurance in Bengalore rural population. Int J Med & Public health 2012; 2(2): 18-22,
Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. PLoS Med 3(1): e442.doi: 10. 1371/journal.pmed.0030442.
Mcpake B (1997). The role of the private sector in health services provision. In: Bennett, Mcpake B, Mills A. private Health Providers in Developing Countries: Serving the public Interest? London, Zed Boos.
Mehta J. Poverty in India. Alternative Economic Survey 2004.
Morris SS, Cogill B, Uauy R. Effective international action against undernutrition: why has it proven so difficult and what can be done to accelerate progress? *Lancet* 2008;371:608-21.
Munro J. Health inequalities 25 yeas after black (Mini symposium). Public Health 2006; 120: 187-188.
Murphy EM. Promoting Healthy behavior. Health Bulletin 2005 (2).1-29.
Murray CJL, Lopez AD. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease study. Lancet 1997; 349:1436-42. 1990-2020:
National Commission on Macroeconoic and Health. Financing and Delivery of Health Care Services in India. Ministry of Health & Family Welfare, Govt. of India 2005.
Nilsson M et al. Connecting the Global Climate Change and Public Health Agendas. PLoS Med 2012; 9(6): e1001227. doi:10.1371/journal.pmed.1001227.
Omachonu VK. Innovation in Healthcare Delivery Systems: A Conceptual Framework. *The Innovation Journal: The Public Sector Innovation Journal*, Volume 15(1), 2010,: 1-20.
Palanivel et al. IJRM 2013; 51(2): 78-83.
Planning Commission. 10th Five Year Plan: Health. Govt. of India.
Pogge T (2002). Word poverty and human right. Cambridge, polity Press.
Raval S. Consumed by hunger. India Today 2001: 66-68.
Roy SK, Roy SK, Bagchi S, et al. Study of KAP of the private medical practitioners about national disease control programs. Indian J Pub Health 2005; 49 (4): 256-257.
Singh KK. Evidence-based public health: Barriers and facilitators to the transfer of knowledge into practice. Indian J Public Health 2015;59:131-5.
Tracy Kidder. Mountains beyond mountains. New York: Random House 2003; 37-44.
Wilkinson WH, Sidel VW. Social applications and intervention in public health. In. (2nd ed) Holland WW, Debels R, Knox G. Oxford textbook of public health: Application in public health (Vol. 3) Oxford Medical Publication, New York 1991.
Narasimhan, R.L et. al (1997). Comparison of fertility Estimates from India's Sample Registration System and National Family Health Survey, NFHS Subject Reports No. 4, IIPS, Mumbai, India.
Reddy S, Pogge T. How not to count the poor. In: Anand S and Stiglitz J (eds), Measuring Global Poverty Oxford OUP 2006.
Registrar General and Census Commissioner, India 2001. Provisional Population. Totals, Paper- I of 2001.
Reichenbach L. The politics of priority setting for reproductive health: breast and cervical cancer in Ghana. *Reprod Health Matters* 2002;10:47-58.
Reich MR. The politics of agenda setting in international health: child health versus adult health in developing countries. *J Int Dev* 1995;7:489-502.
Rice T (1997). Can Markers give us the health system we want? Journal of Health Polities. Polity and Low 22:383-426
Roemer M (1984). Private medical practice: Obstacle t health for all. World Health Forum 5:195-210.
Roy TK. Alternative data sources for demographic and health statistics in India. International Institute for Population Sciences, Mumbai.
Segall M. From cooperation to competition in national health systems- and back: impact on professional ethics and quality of care. International of Health planning and Management 2000; 15:61-79.
Searle JR. The construction of social reality. New York, NY: The Free Press; 1995.
Shaffer E at al. (2005). Global trade and public health. American journal of public health 95:23-34.
Shiffman J. Has donor prioritization of HIV/AIDS displaced aid for other health issues? Health Policy Plan 2008;23:95-100.
Singh JA (2012) Why Human Health and Health Ethics Must Be Central to Climate Change Deliberations. PLoS Med 9(6): e1001229. doi:10.1371/journal.pmed.1001229
Sridhar D, Batniji R. Misfinancing global health: a case for transparency in disbursements and decision making. *Lancet* 2008;372:1185-91.
Stallings RA. Media discourse and the social construction of risk. Soc Probl 1990;37:80-95.
Stocker K, Waitzkin H and Iriart (1999). The exportation of Managed Care to Latin American. New England journal of medicine 340:1131-36.
Task Force for Child Survival and Development [internet site]. Available from: http://www.taskforce.org.

Theodore K (1999). Health sector reform and equity in Jamaica: report to the pan-American Health Organization. Washington DC, PAHO.

Tipping G (2000). The impact of user fees for health care on poor households: commissioned report to the Ministry of Health. Hanoi, Vietnam, Ministry of health.

Toole M et al. (2003). Harnessing the new global health resources to build sustainable health systems. Melbourne, centre for international health, Burnet institute.

Unicef & WHO. *Pneumonia: the forgotten killer of children.* New York, NY & Geneva: United Nations Children's Fund & World Health Organization; 2006.

UN. mdgs.un.org/unsd/mdg/Resources/Static/Products/Progress 2008/MDG_Report_2008.

US President's Emergency Plan for AIDS Relief [internet site]. Office of US Global AIDS Coordinator and the Bureau of Public Affairs. Available from: http://www.pepfar.gov/about/

Werner D, Sanders D (1997). Q1uestioning the solution: The polities of primary health care and child survival. California, Health Wrights.

Whitehead M, Dahlgren G, Even T (2001) Equity and health sector reforms: can low-income countries escape the medical poverty trap? Lancet 358:8336.

WHO (2004). World Health Report 2004-Changing History. Geneva WHO.

Woolhandler S, Himmelstein D (2004). The high costs of for-profit care. Canadian Medical Association journal 170:1814-5.

World Bank (1999). The Kyrgyz republic: participatory poverty assessment, prepared for the global synthesis workshop poverty program. Washington DC, World Bank.

Yu H, et al. (1997). Equity in the utilization of medical services: a survey in poor total China. Institute of Development Studies Bulletin 28:16-23.

Appendix 1

Table 1. Comparative Health indicators of selected countries

Indicators									
Population (Million)	1210	184	164.4	29	20	1341	308.7	60	128.1
Sex Ratio	940	943	978	1014	1034	926	1024	-	1055
Birth Rate	21.4	29.7	21.1	25.1	17.9	13.6	14	12	8.6
Death Rate	7.0	6.8	6.5	6.4	6.6	7.1	8	10	8.8
IMR	39	72	43	41	13	18	9	5	3
< 5 Mortality	49	89	54	51	17	21	8	6	3
Maternal Mort Ratio	167	320	570	830	58	45	11	8	6
Total Fertility Rate	2.4	3.9	2.3	3.1	2.3	1.8	2.1	1.8	1.3
Contraceptive prevalence	56.3	29.6	55.8	48.0	68.0	86.9	72.8	82	54.3
Adolescent Fertility (Per 1000 Girls)	45	20	127	106	28	5	41	26	5
Life Expectancy - Male	66	63	64	63	63	72	76	78	79
-Female	68	64	65	64	76	76	81	82	86
-Both	67	63	65	63	69	74	78	80	83
% Infant LBW	28	19	22	21	22	2	8	8	8
% <5 underweight	43.5	31.3	41.3	38.8	21.1	6.8	1.3	-	-
GNI $/per capita	950	870	470	340	1540	2360	46040	42740	37670
Exp on health % GDP	4.1	2.7	3.4	5.1	4.2	54.3	15.7	8.4	8
Govt exp on health % total exp	26.2	30	33.6	39.7	47.5	44.7	45.5	81.7	81.5
% Out of Pocket Exp	89.9	82.1	97.4	90.8	86.7	92.0	22.6	62.7	80.8
Per capita Total exp on health $	29	19	14	21	85	104	3317	2446	2193
Doctors/10000 pop	6	8	3	2	6	14	27	21	21
Nurses/1000 pop	13	4	3	5	17	10	98	6	95
Health Workers/10,000	0.05	4	1	6	-	-	-	-	-
Beds/10,000	9	6	4	50	31	30	31	39	139

(Source: World Health Statistics 2010; NFHS-3, SRS 2008, ESCAP Population data sheet 2009)

CHAPTER 2

NATIONAL FAMILY HEALTH SURVEY (NFHS-3 & 4)

INTRODUCTION

The National Family Health Survey (NFHS-3) 2005-06 is third in a series of national surveys; earlier NFHS surveys were carried out in 1992-93 (NFHS-1) and 1998-99 (NFHS-2). All three surveys were conducted under the stewardship of the Ministry of Health and Family Welfare, Government of India, with the International Institute for Population Sciences, Mumbai, serving as the nodal agency. ORC Macro, Calverton, Maryland, USA, provided technical assistance for all three NFHS surveys. NFHS-1 and NFHS-2 were funded by the United States Agency for International Development (USAID), with supplemental funding from UNICEF. NFHS-3 funding was provided by the United States Agency for International Development (USAID), the Department for International Development (DFID, United Kingdom), the Bill and Melinda Gates Foundation, UNICEF, the United Nations Population Fund, and the Government of India. Assistance for the HIV component of the NFHS-3 survey was provided by the National AIDS Control Organization and the National AIDS Research Institute (NARI).

Survey Goals

a) To provide essential data on health and family welfare needed by the Ministry of Health and Family Welfare and other agencies for policy and program purposes, and

b) To provide information on important emerging health and family welfare issues.

Survey Objectives

To meet the first of these two goals, NFHS-3, like NFHS-1 and NFHS-2:

I. Provides estimates of important family welfare and health indicators by background characteristics at the national and state levels;

II. Measures trends in family welfare and health indicators over the time at national and state levels;

III. Provides information on several new and emerging issues including:

- perinatal mortality, male involvement in family welfare, adolescent reproductive health, high-risk sexual behavior, family life education, safe injections, tuberculosis, and malaria;
- family welfare and health conditions among slum and non-slum dwellers in eight cities (Chennai, Delhi, Hyderabad, Indore, Kolkata, Meerut, Mumbai and Nagpur); and
- HIV prevalence for adult women and men at the national level, for Uttar Pradesh, and for five high HIV prevalence states, namely, Andhra Pradesh, Karnataka, Maharashtra, Manipur, and Tamil Nadu.

Methods

Study Tools

Three different interview schedules were used for collecting household data and interviewing eligible women and men.

Procedural Manuals

To maintain uniform survey procedures across the states and minimize non-sampling errors, eight different comprehensive manuals were prepared. They are as follows:

1. Manual For Household Listing and mapping
2. Interviewers Manual
3. Supervisor's and Editor's Manual
4. Training Guidelines
5. Anthropometry, Anemia and HIV testing field manual
6. Training Interviewers to implement the household relations section (Section 10) of the NHFS-3 women's questionnaire
7. Project Directors Manual
8. Manual For Secondary Data Edits

In NFHS-3, interviews were conducted with eligible respondents using a household interview schedule, a Woman's interview schedule (for women aged 15-49 yrs), and a Man's interview schedule (for men aged 15-54 yrs).

1. Household Interview: Interview with the household head or any adult household member.
2. Also as part of the household interview, cooking salt was tested for iodine content.
3. Individual respondent's interview.
4. Measurement of height, weight and hemoglobin content in the blood of interviewed women, men, and children born in January 2000 (January 2001 for the second round of interviewing) or later, were at least 6 months old, using the HemoCue instrument.
5. Collection of blood samples on filter paper cards from men aged 15-54 years and women aged 15-49 years for HIV testing.

Survey Process

The Survey was conducted in five phases. These were:

A. Project Planning and Management;
B. Survey Preparation and interview schedule design;
C. Research organizations involved in NHFS 3 fieldwork;
D. Training Programs; and
E. Data Collection.

Project Planning and Management

Decisions about policies and procedures for NFHS-3 were reviewed by three project committees, namely:

1. **Steering Committee** which provided overall guidelines to the project chaired by the Secretary, Ministry of Health and Family Welfare.
2. **Administrative and Finance Committee** provided guidance on issues related to finances, chaired by Additional Secretary and Financial Advisor, GOI.
3. **Technical Advisory Committee** provided technical support to the project on matters of sampling, interview schedule content, format of the reports and the tabulation plan, chaired by Director, National Institute of Medical Statistics, New Delhi.

The project management unit (PMU) was responsible for implementation of the project.

Survey Preparation and interview schedules Design

The preparatory activities included designing the sample, preparation of interview schedules and their translation into Hindi, and selection of the Research Organizations (ROs) for conducting the fieldwork. IIPS translated the interview schedules into Hindi, the language of interview in 10 out of 29 states (including Delhi). The interview schedules were subsequently translated into 19 additional Indian languages.

Research Organizations involved in NFHS-3 Fieldwork

18 Research Organizations were selected for NFHS-3 data collection.

Training Programs

Given the large number of organizations involved in the survey, as well as the number of individuals and skills required to successfully implement all of the different stages of NFHS-3, several types of training workshops were held.

1. Health Coordinators' Training: Eight Health Coordinators, medical personnel, specially employed by IIPS for the NFHS-3 project, for the supervision of data collection on biomarkers were trained for two weeks at IIPS in methods

of blood collection, haemoglobin testing, and height/weight measurement. The training involved classroom sessions, and practice sessions in the classroom, at health centers and in the community.

2. Household Listing and Mapping Workshops: Two workshops of three days duration were organized for household listing and mapping. The workshop for the states participating in the first phase of fieldwork was held in 2005, and for the second phase in 2006. Two persons responsible for coordinating, mapping and household listing from each Research Organization were trained in mapping and household listing operations. The training involved classroom sessions and field practice in rural and urban areas.
3. Training of Trainers (ToT) Workshops: Two training workshops were held for training the trainers of field staff of the Research Organizations. At least two trainers for each state were trained in training interviewers, supervisors and editors. The training involved discussion on the questionnaires, lectures of guest speakers on special topics of HIV/AIDS, Domestic violence and Family Planning Methods.
4. Health Investigators' Training: The centralized training of two weeks' duration was organized for all the health investigators, separately for phase 1 and phase 2 states.
5. Data Processing Training: Two coordinators from each research organization were trained in office editing of data and data entry software.

Data Collection and Processing

NFHS-3 fieldwork was carried out in two phases. The first phase activities started in August 2005 and data collection was done from December 2005 to May 2006. The second phase started in January 2006 and data collection was carried out from April to August 2006. In the first phase, 12 states were covered and in the second phase the remaining 17 states were covered.

Data processing involved office editing, data entry using CSPro software, verification of data entry, secondary editing, and final cleaning of data. For quality assurance, field check tables were generated on a regular basis, starting soon after a few questionnaires were entered.

Sample size

Since most of the key indicators in NFHS 3 were to be estimated referred to ever-married women in the reproductive ages of 15-49 years, the target sample size for NFHS-3 in each state was estimated in terms of the number of ever-married women in the reproductive age group to be interviewed. In NFHS-3, the initial target sample size was calculated to be 4,000 completed interviews with ever-married women in states with a 2001 census population of more than 30 million, 3,000 completed interviews with ever-married women in states with a population between 5 and 30 million (as per 2001 census), and 1,500 completed interviews with ever-married women in states with a population of less than 5 million. In addition, sample-size adjustments were made to meet the need for HIV prevalence estimates for the high HIV prevalence states and for slum and non-slum estimates in selected cities, therefore the sample size in some states was higher than that fixed by the above criteria.

The sample size of HIV tests was estimated on the basis of the assumed HIV prevalence rate, the design effect of the sample, and the acceptable level of precision. With an assumed level of HIV prevalence of 1.25% and 15% relative standard error, the estimated sample size came out to be 6400 tests each for men and women in high HIV prevalence states. At the national level, the assumed level of HIV prevalence of less than one percent (or 0.92%) and less than 5% standard error gave an estimate of 125,000 HIV tests needed at the national level. The HIV tests were carried out only in a subsample of households in which men were interviewed.

Sample Design

The urban and rural samples within each state were drawn separately and, to the extent possible, the sample within each state was allocated proportionally to the size of the state's urban and rural populations. A uniform sample design was adopted in all the states. In each state, the rural sample was selected in two stages: the selection of Primary Sampling Units (PSUs), which are villages, with probability proportional to population size (PPS) at the first stage, followed by the random selection of households within each PSU in the second stage. In urban areas, a three-stage procedure was followed. In the first stage, wards

were selected with PPS sampling. In the next stage, one census enumeration block (CEB) was randomly selected from each sample ward. In the final stage, households were randomly selected within each sample CEB.

Sample Selection

In rural areas, the 2001 Census list of villages served as the sampling frame. The list was stratified by a number of variables. The first level of stratification was geographic, with districts being subdivided into contiguous regions. Within each of these regions, villages were further stratified using selected variables from the following list: village size, percentage of males working in the nonagricultural sector, percentage of the population belonging to scheduled castes or scheduled tribes, and female literacy. In addition to these variables, HIV prevalence status, i.e. "High", "Medium" and "Low" as estimated for all the districts in high HIV prevalence states, was used for stratification in high HIV prevalence states. Female literacy was used for implicit stratification (i.e., the villages were ordered prior to selection according to the proportion of females who were literate) in most states although it may have been an explicit stratification variable in a few states.

Mapping and Listing Operation

A mapping and household listing operation was carried out in each sample area in every state. The listing provided the necessary frame for selecting households at the second stage. The household listing operation involved preparing up-to-date notional and layout sketch maps of each selected PSU, assigning numbers to structures, recording addresses of these structures, identifying residential structures, and listing the names of head of all the households in residential structures in the selected PSUs.

HIV Testing

In response to an urgent need to have nationally-representative data on HIV prevalence and comprehensive information on knowledge and attitudes about HIV/AIDS, high-risk sexual behavior, and practices related to HIV testing in India, it was proposed to incorporate these issues in NFHS-3. It was planned to provide HIV seroprevalence levels for the population of women age 15-49 and men age 15-54 at the national level and for each of the six high HIV prevalence states as identified by National AIDS Control Organization (NACO), namely, Andhra Pradesh, Karnataka, Maharashtra, Manipur, Nagaland and Tamil Nadu. Considering the large sample size in Uttar Pradesh it was further decided to provide estimates of HIV prevalence for the state of Uttar Pradesh also. NFHS-3 is the first large scale nationwide survey in which a technique of testing Dried Blood Spots was used for HIV testing.

The survey approach was different in the six high HIV prevalence states from the rest of India. The HIV testing was anonymous. No names or other contact information were recorded on the dried blood spot (DBS) samples. Instead, a bar code label with randomly generated numbers was pasted on the filter paper sample and on the questionnaires. Respondents were not to receive the results of the testing since the protocol design made it impossible for the survey staff to know the HIV status of individual participants. All of the information obtained from the household and individual interviews, however, would be linked to the HIV test results through the bar codes. All individuals who were eligible for testing in the survey, whether they accepted the testing or not, received referrals for free HIV counseling and testing at a local health facility. All the individuals selected in the sample for HIV testing were asked to provide informed voluntary consent to the testing.

Laboratory testing protocol

The current recommendations of WHO/UNAIDS for population-based seroprevalence estimation were followed. This algorithm involved the following steps:

Step 1: Select two antibody tests from different manufacturers (Assays A and B).

Step 2: Test the sample using Assay A:

If the result is negative, report the final result as negative.

Step 3: If the result is positive, test the sample using Assay B.

If the result is again positive, report the final result as positive.

Step 4: If the result with assay B is negative, retest the sample with BOTH Assays A and B:

If the 2nd pair of results are both negative, report the final result as negative.

If the 2nd pair of results are both positive, report the final result as positive.

If the 2nd pair of results are inconsistent (1 positive and 1 negative), report the final result as indeterminate. Note: Steps 3 and 4 was followed for a subsample of 5-10% of the negative samples.

Sampling

In NFHS-3, 18 research organizations conducted interviews with more than 230,000 women age 15-49 and men age 15-54 years throughout India. NFHS-3 also tested more than 100,000 women and men for HIV and more than 200,000 adults and young children for anemia. Fieldwork for NFHS-3 was conducted from December 2005 to August 2006.

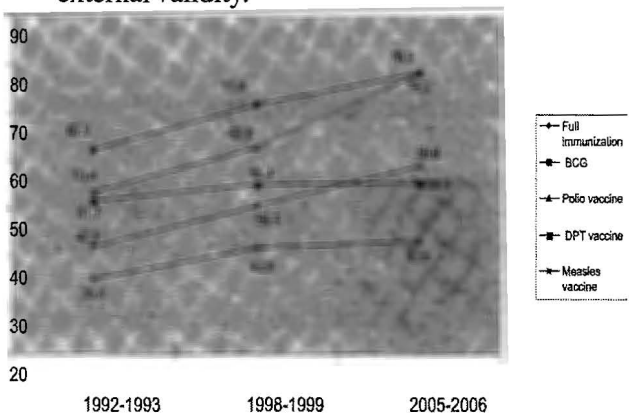
Results of the NFHS-3 Survey

According to the NFHS-3, 67.4% of the population lived in rural areas. Mean household size was 4.8. 68% households in India had electricity. 42% of population had piped drinking water as compared to 39% and 33%, at the time of NFHS-2 and 1 respectively. However, only 44.5% of the household had toilets as compared to 36% and 30% of households had toilet facility at the time of NFHS-2 and NFHS 1 respectively. About 68% of population above 6 years were literate (81% males and 61.3% of females) in NFHS-3. Fertility continues to decline in India and there is increasing trends of contraceptive use. Decrease in mortality and morbidity rates has also been observed. The various indicators measured in all 3 NFHS are shown in table 2.1.

Vaccine Coverage: Vaccine coverage has improved as shown in NFHS 3 but failed to reached the goals of National Population Policy 2000. (NPP-2000).

Strengths of the survey

- Random sampling has been done that improves external validity.



- Validated Questionnaires and trained manpower to collect information were used with good supervision that decreased the non-sampling error which improve internal validity.
- Wide range of health information was collected - IMR, contraception, immunization, anemia, breast feeding practices, HIV and media exposure.

Table 2.1 Difference between indicators measured in NFHS-I and II

Indicators	NFHS I	NFHS II	NFHS III
Literacy (%)			
Male	57	75	83
Female	31	51	59
Watch television at least once a week (%)	32	46	73
Crude Birth Rate (per 1000)	29	25	23
Crude Death Rate (per 1000)	9.7	9.7	7.4
IMR	79	68	57
Teen pregnancy (15-19 years)	-	-	16
Total Fertility Rate	3.4	2.9	2.7
Birth order 4 & above (%)	31	28	-
Contraceptive Prevalence (%)	41	48	56
Sterilization	31	36	37
Modern Methods	37	43	48
ANC 3-check ups (%)	44	44	51
I& FA Tab. recieved for 90 days %	-	-	22
Two TT inj. recieved in last preg %	-	-	72
Birth in Medical Institutions (%)	26	34	41
Delivery assisted by a health prof(%)	33	42	49
Mother who knows about ORS (%)	43	62	-
Children given ORS: sick with diarrhea	18	27	26
Children taken health center with ARI	-	-	71
Vaccination coverage (All %)	35	42	44
BCG (%)	62	72	78
Polio 3 doses (%)	54	63	78
DPT3 (%)	52	55	55
Measles (%)	42	51	59
Child breastfed in one hr of birth (%)	9.5	16	23
Under weight in children <3 years of age	52	43	40
Stunted < 3 years of age Children %	-	51	45
Wasted < 3 years of age Children %	-	20	23
Anemia (6-35 months) %	-	74	79
Anemia (15-49 Ever-married) women %	-	52	56
Anemia (15-49 pregnant women) %	-	50	58
Anemia 15-49 year Men %	-	-	24
Women BMI less than normal %	-	36	33
Men BMI less than normal %	-	-	28
Women overweight/obese %	-	11	15
Men overweight/obese %	-	-	12
Knowledge about HIV/AIDS			
Women heard about it	-	40	57
Men heard about it	-	-	80
Women know condom can prevent	-	-	35
Men knows condom can prevent	-	-	68
Women experience spousal violence	-	-	37

Weaknesses

- Sample did not include union territories that gave under-representation of urban and well performing areas.
- Survey is based on large sample but can not be considered to be representative to India's diversification.
- HIV testing included only adult population leaving most vulnerable group i.e., adolescents and children. Some of the high risk groups are also not included such as truck drivers, commercial sex workers, street children and drug addicts, etc.
- Large number of interviewers were recruited that may have introduced interviewer bias and due to lack of privacy, information bias could also be a cause of concern that affect internal validity.

COMMENTS

1. Political will is lacking because after three successful phases of NFHS the fourth survey is still pending. This should be concurrently done with Census which could have provided very strong data.
2. Levels of malnutrition among children below three years remain unacceptably high. In 2006-07, 40% of children under three year of age were underweight, 45% were stunted and 22% were wasted. A strong rural disadvantage in child malnutrition persists across the country. And there has been practically no change in the rural urban differentials over the last seven years in the proportion of stunted, wasted and underweight children.
3. At the national level, the high levels of child malnutrition can be explained in part by the limited access to and reach of health services. Equally striking is the poor feeding habits largely responsible for the onset of malnutrition in the early stages of a child's life. And there are glaring shortfalls in the status of women's health and her access to maternal care services.
4. Progress in reducing undernourishment among children over the past seven years has been poor which indicates the poor access to health services, care of children and nutritional status of women. To address the nutritional well being of the child the intergenerational transfer of malnutrition from the mother to the child needs to be checked.
5. Preliminary results of NFHS -3 confirm the continuing neglect of health, inadequate reach and efficacy of health services, the failure of strategies to reach to newborns and those under three years, and the weakness in administrative arrangements to assure children their right to adequate nutrition and health. These deficiencies and shortcomings need to be addressed with a sense of urgency for safeguarding the interests of children and for establishing the foundations of a prosperous and healthy society.
6. In vaccination coverage there is hardly any improvement since NFHS I particularly in DPT 3 though lot of investment has been made in vaccination program.
7. Despite launching of RCH program there is not much improvement in mothers' health. Male involvement in contraceptive use has also not improved. The findings of the survey indicate that serious thought is required to detect and remove from causation of these health problems from the community.

NATIONAL FAMILY HEALTH SURVEY - 4

NFHS-4 is the fourth survey in the NFHS series of surveys and are conducted under the stewardship of MOHFW. IIPS, which was the nodal agency for NFHS-1, NFHS-2 and NFHS-3 has also been appointed the nodal agency for NFHS-4.Technical assistance for the NFHS was provided mainly by ORC Macro (USA) and other organizations on specific issues. The funding has been provided by USAID, DFID, the Bill and Melinda Gates Foundation, UNICEF, UNFPA, and MOHFW, GOI.

Features

- — In this round, information on malaria prevention, migration in the context of HIV, abortion, violence during pregnancy etc. have been added.
- — The scope of clinical, anthropometric, and biochemical testing (CAB) or Biomarker component has been expanded to include measurement of blood pressure and blood glucose levels.
- — Computer Assisted Personal Interviewing (CAPI) is distinct feature of this survey.

— For the first time, NFHS-4 will provide district level estimates with separate estimates for urban-rural areas for 157 districts having level of urbanization from 30-70%.

SPECIFIC OBJECTIVES

1. Provide estimates of the levels of fertility, infant and child mortality, and other family welfare and health indicators by background characteristics at the national and state levels; and
2. Measure trends in family welfare and health indicators over time at the national and state levels

EXPANDED OBJECTIVES

— Ownership of physical and economic assets for women
— Malaria prevention
— Expanded domain of Clinical, Anthropometric and Biochemical(CAB)
— Consanguinity in marriage
— Age at puberty and menstrual hygiene
— Family welfare and health conditions among slum dwellers;
— Non-communicable diseases;
— Use of emergency contraception;
— Abortion
— JSY, JSSK and out of pocket expenditure for Inst Delivery
— Migration in the context of HIV
— HIV testing during ANC visits
— Violence during pregnancy

Methodology

All 640 districts as per 2011 Census were covered. Interviews was conducted with Ever-married and Never-married women (age 15-49) and Ever-married & never married men (age 15-54). Similar to NFHS-3, slum/Non slum estimates were given for eight cities (Chennai, Delhi, Hyderabad, Indore, Kolkata, Meerut, Mumbai, and Nagpur).The survey uses three questionnaires namely Household Questionnaire, Woman's Questionnaire and Men's Questionnaire. This is the total sample of 628,826 women and 94,324 men eligible for the interview. In these selected households, information on approximately 267,272 children below age 5 years was collected. The domain of Clinical, Anthropometric and Biochemical (CAB) testing is being further expanded in NFHS-4 to include random blood glucose and hypertension measurements with estimates to be reported at the district level for women age 15-49 and men age 15-54. As with anaemia, testing of these new CAB components in the field is conducted using portable equipment.

BIOMARKERS IN NFHS-4

— BMI
— Anaemia testing
— Salt iodization
— HIV testing
— Hypertension
— Blood glucose

Findings

— 15 states shows that 37 per cent of children under the age of five in these states is stunted, a fall of just five percentage points in a decade. Bihar and Madhya Pradesh are the worst off, with 48 and 42 per cent respectively.
— 22 per cent of children under the age of five in these states are wasted. 34 per cent of children under the age of five in these states are underweight.
— The proportion of anaemic children aged 6 to 59 months fell just five percentage points to 61% in 2014, and over half of women aged 15-49 are still anaemic. Of all men aged 15-49, a quarter are suffering from anaemia, as was in 2004
— After the last round of National Family Health Survey in 2005-06, infant mortality has declined in all first phase 15 States/Union Territories for which trend data are available.
— All 15 States/Union Territories have rates below 51 deaths per 1,000 live births, although there is considerable variation among the States/Union Territories.
— Infant mortality rates range from a low of 10 in Andaman and Nicobar Islands to a high of 51 deaths per 1000 live births in Madhya Pradesh.
— 10.6% females consume tobacco
— 46.8% females consume tobacco
— 3.5% females consume alcohol
— 38.27% males consume alcohol
— Sex ratio is 985 per 1000 males
— Institutional deliveries has increased to 80.4%. Prevalence of Diabetes (>140 mg/dl) and Hypertension (>140 mmHg) of few states are given in table 2.2.

Table 2.2: Blood Sugar and Hypertension prevalence among adults (15-49 yrs) few states

	BS >140 mg/dl		Hypternsion	
	Male	Female	Male	Female
Andhra Pradesh	9.8	8.2	16.2	10.0
Tamil Nadhu	9.7	7.1	15.5	8.3
West Bengal	11.4	7.4	12.4	10.3
Maharashtra	5.9	5.0	15.9	9.1
Uttrakhand	8.8	7.4	12.4	10.3

References

Govt. of India. National family Health Survey III (2005-2006). IIPS, Ministry of Health & Family Welfare, Mumbai 2007. And also for I and II NFHS reports.

Govt. of India. National family Health Survey IV (2014-2015). IIPS, Ministry of Health & Family Welfare, Mumbai 2016.

Shivakumar AK. Why are levels of child malnutrition not improving? Economic and Political Weekly 2007; XLII (15): 1337-1345.

CHAPTER 3

PLANNING OF PUBLIC HEALTH IN INDIA

INTRODUCTION

National Health Planning has been defined as the orderly process of defining national health problems, identifying unmet needs and surveying the resources to meet them, establishing priority goals that are realistic and feasible and projecting administrative action to accomplish the purpose of the proposed program.

Planning of public health services means careful analysis, intelligent interpretation and orderly development of these services, in accordance with modern knowledge, techniques and experiences, to meet the health needs of a nation within its resources. Planning is essentially a process of making choice between available alternatives at all levels of decision-making. A health plan is a predetermined course of action that is firmly based on the nature and extent of health problems, from which priority goals are devised (Kishore 2013).

National health of any country is one of the vital components of global health. Each country irrespective of its physical size or size of the population contributes to the health status of the people of the whole world. India is a vast country and is only next to China in population size. It has the oldest tradition of public health practices. India's health has direct bearing on the international health. That is why planning for health is a major concern not only for India but of the whole world.

HISTORY

History of public heath services in India can be traced back to pre-medieval times. Concerns in health development and public health date back to the Indus Valley Civilization. One finds evidence of well-developed environmental sanitation program in the cities of that time such as underground drains, public baths, etc. First concrete evidence of public health is available from the Great Asoka period (Kishore 2001, Reddy 2004) when hospitals were set up for sick people. Many instructions for better living were written down and emphasis was given not only to human health but also gave to animal and environmental health.

Planning in Modern India

Bhore Committee (1943-46)

Over a period of time the health status deteriorated due to foreign invasions, conflicts, wars, civil unrest, etc. However, during British rule in India, there was an effort towards the improvement of public health in the form of opening of hospitals and medical colleges. Structured health policy making and health planning

in India is not a post-independence phenomenon. In fact, the most comprehensive health policy and plan document ever prepared in India was on the eve of independence in 1946. A National Planning Commission was set up by the Indian National Congress in 1938. First time in 1943, the then British government appointed the "Health Survey and Development Committee" with Sir Joseph Bhore as Chairman. The committee had submitted an elaborated report in 1946 which is still one of the masterpieces of planning for India. Report described the prevailing health condition at that time. Death rate was 22.4 per thousand population. IMR was 162 per 1000 live births. MMR was 20 per 1000 live births. Life expectancy was 26.9 for male and 26.5 for female. Infant deaths of all deaths was 24.3% which was many times higher than England which was just 6.8%. Report also elaborated on major diseases which were responsible for deaths: cholera, plague, smallpox, dysentery and diarrhea, respiratory diseases, and others. The causes enumerated were: prevailing sanitary conditions, nutrition, inadequacy of existing medical and preventive health organization, general education and health education, social background of ill health. Detail description of various measures undertaken by British India were also given. Report documented following major recommendations:

- A comprehensive primary health system based on smallest service unit for 10000 to 20000 population with 75 beds and 6 doctors and 6 public health nurses.
- Setting up of 30 bedded hospitals for every two primary health units.
- One bed per 175 population. One doctor per 1,600 and one nurse per 600 population.
- One 650 bed hospital at taluka (3 lakh population) level and one district hospital of 2,500 beds.
- No patents in pharmaceutical products
- 15% of government expenditure on health care
- village health committee should be formed to secure their active cooperation and support.
- Doctors should behave as 'social doctors'.
- Formation of district board for each district with district health officials and representative of the public.
- Ensure suitable housing, sanitary surroundings, safe drinking water supply, and elimination of unemployment.
- More emphasis on preventive work.

The minimum requirement recommended by the Bhore committee was:

	Existed		*Recommend*
	India	*UK*	
Hospital beds/ 100,000 pop	24	714	567
Doctors/ 100,000 pop	15.87	100	62.3
Nurses/100.000 pop	2.32	333	150.8

The Bhore Committee ended its report on a clear note of urgency for implementation of the plan in its full form. However, in the 1950s and 1960s the entire focus of the health sector in India was to manage epidemics. Mass campaigns were started to eradicate various diseases. These separate countrywide campaigns with a techno-centric approach were launched against malaria, smallpox tuberculosis, leprosy, filarial, trachoma and cholera. Cadres of workers were trained in each of the vertical programs. The National Malaria Eradication Program (NMEP) alone required the training of 150,000 workers spread over 400 units to handle the prevention and curative aspects of malaria control.

The NMEP was started in 1952 with aid from the Technical cooperation mission of the U.S.A and technical advice from WHO. Malaria during that period was considered an international threat. DDT spraying operations were one of the most important activities of the program. The tuberculosis program involved vaccination with BCG, setting of TB clinics, and provision of domiciliary services and after care.

The government since the inception of Bhore Committee has been setting up from time to time various committees to examine health situation or any important problem facing the country to sought suggestions for reform, in addition to 5 year plans. The brief description is given below:

Chopra Committee (1948)

Suggested synthesis of Indigenous and modern medicine through integration in education and multi-disciplinary research.

Dasgupta Committee (1949)

Looked into housing, water supply, general sanitation, conservancy and drainage systems, waste disposal, vector control etc.

Balwant Rai Mehta Committee (1957)

Under the chairmanship of Balwant Rai, a committee was appointed to examine the performance of community development program which was started in 1952. But the report indicated that program is a failure because of lack of local initiative. Henceforth the committee recommended setting up 3 tier system of panchayati raj institution -village, block and district level-for planning and development.

Renuka Roy Committee (1960)

It was a School Health Committee which recommended promotion of preventive care through schools, provision for school meals, health education as part of school curricular, and integration of school health through the primary health care network.

Mudaliar Committee (1962)

To evaluate the progress made in the first two five year plans and to draw up recommendations for the further development of health services, a Committee was set up in 1959 under Dr. A Lakshmanswami Mudaliar. The report of the committee recorded that the disease control programs had some substantial achievements in controlling certain virulent epidemic diseases. Malaria was reported to be under control. Deaths due to malaria, cholera, smallpox etc. were halved or had sharply reduced and the overall morbidity and mortality rates had declined. The death rate had fallen to 21.6 per cent during the period 1956-61. The expectation of life at birth had risen to 42 years. However, the tuberculosis program was reported to be lagging behind.

Following major recommendations were made by the Committee:

- Upgrading and strengthening of PHC's.
- Strengthening of District Hospitals.
- Mobile service teams for rural areas.
- Levy of small fee for those availing hospital facilities, except on those who are really poor.
- Long range health insurance policy for all citizens.
- Formation of Central Health Cadre.
- Extension of the functions of the University Grant Commission to education in the medicine, engineering, agriculture, and vetenary sciences.
- Institute of National Programs in regard to Malaria Eradication, Small pox, Cholera, Leprosy, Tuberculosis and Filariasis.
- Making the central council of health more effective.

Chadha Committee (1963)

A special committee under the chairmanship of Dr. MS Chadha, Director General Health Services, was appointed to recommend the requirement related to PHC and maintenance of Malaria Eradication Program. The Committee proposed:

- Control of Malaria in maintenance phase is the responsibility of the general health services.
- Vigilance through medical institutions must be developed.
- Multipurpose domiciliary health services should be developed for all health programs including malaria, smallpox, control of other communicable disease, health education, etc.

Mukherjee Committee (1966)

Multiple activities of the mass programs like family planning, smallpox, leprosy, trachoma, NMEP (maintenance phase), etc. were making it difficult for the states to undertake them effectively because of shortage of funds. The Mukherjee Committee worked out the details of the Basic Health Service which should be provided at the block level, and some consequential strengthening required at higher levels of administration. The following recommendations were made:

- Strengthening of the administrative set up at different levels from primary health unit to the state headquarters.
- Delinking malaria maintenance activities from family planning program in order that the family planning could receive undivided attention of its staff and could be carried through as a crash mass program.

Jain Committee (1966)

Under the chairmanship of Shri AP Jain a committee was formed to review the working of different hospitals and functioning of central health services. Following recommendations were made by the committee:

1. Out patient bed for 1000 population.
2. 10% of the OPD patients need emergency treatment.
3. Fee should be charged: 10 paisa per person in OPD, 25 paisa per day stay in hospital and patients

who have more than Rs. 200 per month income should also be charged for their diet.
4. Preference should be given to establish new hospital in backward states.
5. The linen management of the hospital should be the responsibility of matron /assistant matron.
6. Higher allowance should be given to doctors working in rural areas.

Jungalwalla Committee (1967)

This committee, known as the "Committee on Integration of Health Services" was set up in 1964 under the chairmanship of Dr. N Jungalwalla, the then Director of National Institute of Health Administration and Education (currently NIHFW). It was asked to look into various problems related to integration of health services, abolition of private practice by doctors in government services, and the service conditions of doctors. The committee defined "integrated health services" as "a service with a unified approach for all problems instead of a segmented approach for different problems. Medical care and public health programs should be put under charge of a single administrator at all levels of hierarchy."

Following steps were recommended for the integration at all levels of health organization in the country

- Unified Cadre
- Common Seniority
- Recognition of extra qualification
- Equal work equal pay
- Special pay for special work
- Abolition of private practice by government doctors
- Improvement in their service conditions

Kartar Singh Committee (1972-73)

This committee was set up to study the family planning program. It made following recommendations:

- Multipurpose workers, for the delivery of health, family planning and nutrition services to the rural communities, are both feasible and desirable.
- To begin with, one male health worker (MPW) should be available for a populations of 6,000 to 7,000.
- Each PHC should ultimately serve 50,000 populations and should have 16 sub-centers spread over its areas.
- At least one female worker (ANM) should be available for a population of 10,000 to 12,000.
- Training for all workers engaged in the field of health, family planning and nutrition should be integrated.

Shrivastava Committee (1974-75)

Under the Chairmanship of Dr. JB Shrivastava this committee made following recommendations:

- Organization of the basic health services (including nutrition, health education and family planning) within the community itself and training of the personnel needed for this purpose.
- Organization of an economic and efficient program of health services to bridge the community with the first level referral center-PHC.
- The creation of a National Referral Service complex by the development of proper linkage between the PHC and higher level referral and service center.
- Create the necessary administrative and financial machinery for the reorganization of the entire program of medical and health education from the point of view of the objectives and needs of the proposed program of national health services.

Siddhu Committee (1977)

Under the chairmanship of Dr. SS Siddhu the committee reviewed the hospitals of Delhi. It recommended that there is a need of accidents and emergency department with officer in-charge in every hospital. It also emphasized on the need of strengthening of medical, nursing and paramedical staff and hospital administration as a separate specialty.

Krishnan Committee (1982)

This committee emphasized the need of revamping of primary urban health services for slum dwellers and poor. According to it, basic health services and family welfare services should be made available within 1-3 km of their dwellings having appropriate linkage with secondary and tertiary care services.

Bajaj Committee (1986)

This committee acted as an Expert Review Committee for Health Manpower under the Chairmanship of JS Bajaj, which made the following recommendations:

- A National Policy on education in health sciences must be enunciated.
- A realistic health manpower survey should be carried out.

- There should be teachers training in health education, science and technology.
- Educational Commission for Health Science should be developed to provide realistic projections for national health manpower and creation of educational institutions and facilities and establishment of one or more universities of health sciences. Educational commission would suggest the desired changes in curricula and would plan and implement appropriate changes in educational system. It would also develop in-build mechanism of review, monitoring and mid-course corrections. This commission should also coordinate with intersectoral research.

PLANNING

Planning for health involves three types of activities: (A) assessment of the current status, (B) identification of the desired state in the future, and (C) specification of interventions and other activities that will affect the necessary changes to achieve the new desired states. The steps for planning in health are not different than that of planning process. For many decades, the Center was taking all the decisions pertaining to planning for the whole country with very little involvement of the local authorities and small blocks and village panchayats. This method is also known as "Top down Approach". Lately, it has been realized that it is necessary to involve the basic unit of operation such as Panchayats, Primary Health Centers, etc. in planning and decision making process. This is also referred to as the "Bottom Up Approach" in planning (decentralized planning). *Decentralization* is systematic delegation of authority in an 'organization-wide context. It is dispersion of the same type of work or activity with full executive powers to the responsible authorities of various areas away from the center, thereby locating the work close to the source that initiates the activity. Basically this entails pushing the decision-making point to the lowest managerial level possible. It involves the delegation of decision-making authority, a system of management in which decisions are taken at lower levels.

Now the emphasis is more on latter approach, which is more practical, democratic, and more suitable for the local needs. However, most of the time approach is still top down (Figure 3.1).

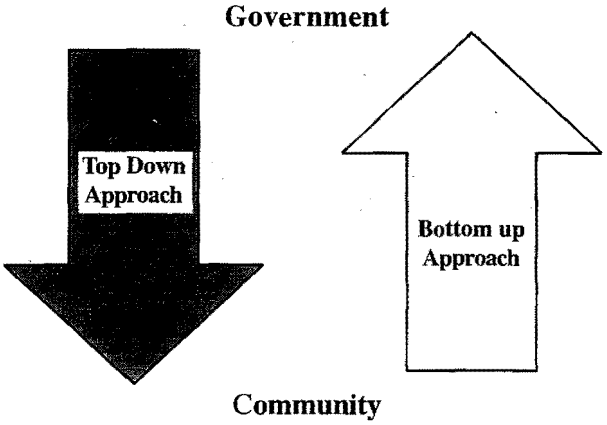


Figure 3.1: Top-down and bottom-up approach

Planning Process

Planning is a rational process or cycle (Figure 3.2) which involves a number of steps:

1. **Pre-Planning:** An effective health planning would depend upon the interest of the government as manifested by clear policies framed by the political authorities and the health legislation enacted by the legislature. Besides, there should be an infrastructure to plan for public health care. There should be health planning units in each state and in the center.
2. **Analysis of Health Situation:**

A. *Assessment of the present health situation:* is done on the basis of health and vital statistics made available through various reports, research papers, surveys, census of India, etc. Following data are analyzed and interpreted:
   (a) Characteristics of population e.g. age, sex, cause of death statistics, morbidity data, and environment data related to the health;
   (b) Data on health facilities, e.g. hospitals, clinics, run by public, private and voluntary agencies according to the geographical distribution, utilization, nature and functions;
   (c) Data on available resources, e.g. personnel, material and finance; and
   (d) Data on training institutions for health personnel.

B. *Projection of the health situation:* is done over the period of plan or longer time to ensure availability of resources required to sustain the program activities.

3. **Identifying Health Problems and Challenges:** On the basis of the projected data, one can

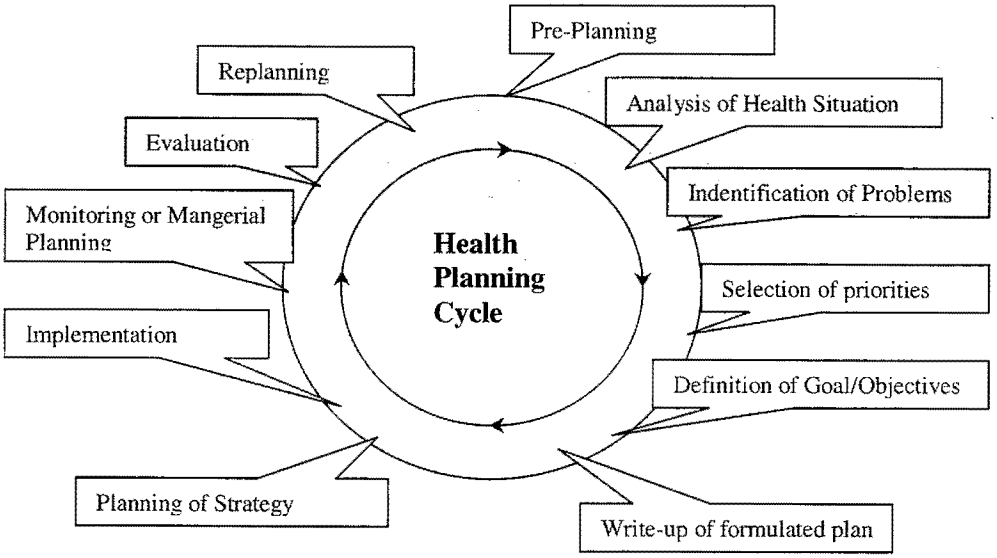


Figure 3.2: Health Planning Cycle

enumerate the health problems which need to be tackled during the plan. For example the priority problems identified in the tenth plan are:

(a) Persistent gaps in human resource and infrastructure especially at the primary health care level;
(b) Suboptimal functioning of the infrastructure; poor referral services;
(c) Plethora of hospitals not having appropriate manpower, diagnostic and therapeutic services and drugs in government, voluntary and private sectors;
(d) Massive interstate, inter-districts, intercastes differences in performance as assessed by health and demographic indices; availability and utilization of services are poorest in the most needy states / districts.
(e) Suboptimal intersectoral coordination;
(f) Increasing dual burden of communicable and noncommunicable diseases because of ongoing demographic, life-style and environmental transitions;
(g) Technological advances including telemedicine, which widen the spectrum of possible intervention;
(h) Increasing awareness and expectations of the population regarding health care services;
(i) Escalating costs of health care, ever widening gaps between what is possible and what the individual or the country can afford.

4. **Selection of Priorities:** Amongst these numerous problems we need to prioritize our focus of attention. Number of factors are taken into consideration when deciding upon the priority problems e.g., economical, technical, financial, social, political, administrative, ethical, international pressure, etc. However, recent development of the comprehensive system of measuring burden of health problem in terms of Disability Adjusted Life Year Lost (DALY) by the World Bank, has contributed significantly in removing the biases and prioritizing the health problems according to scientific evidences.
5. **Definition of Goals and Objectives:** Goal is the direction in which the plan is to proceed and the term is used more often in the case of long-term planning. The objective is a precise statement of the ends intended to be achieved. We must built the hierarchy of objectives, i.e., ultimate, intermediate and immediate.
6. **Write-up of Formulated Plan:** After deciding the priorities goals and objectives, the next step is to prepare a write-up of the plan. This may contain a time schedule for the plan to be implemented and procedures which deal with the rules for implementing plan and other details so that evaluation becomes easy and meaningful.
7. **Strategy:** The strategy could be a change in approach in implementation/intervention or strengthening of public health care system or

involvement of different sectors (integration) or merging of various programs in one program or launching of a new program, etc. For example, launching of National Rural Health Mission.

8. **Implementation:** Plan implementation requires cooperation, coordination and commitment at all levels of the implementing machinery starting with the Ministries of Health at the Union and State levels through various secretariat organizations, and at the district, block or village level.
9. **Monitoring or Managerial Planning:** Monitoring is observation and taking action if situation/status deteriorate from the preset /pre-planned situation/status. Objectives and targets are already set up for which a particular strategy is implemented. Monitoring is to ensure that targets are achieved and it helps in verifying whether the performance is according to the time schedule.
10. **Evaluation:** It measures the degree to which objectives and targets are fulfilled and the quality of the result obtained. It measures the productivity of available resources in achieving clearly defined objectives and whether output or program is cost effective. Evaluation can be performed by internal management system but it should be carried out by an outside agency for effectiveness of the plan. The impact and suggestions of the plan must be studied seriously.
11. **Replanning:** Based on the experiences and suggestions made in evaluation, replanning should be carried out.

Planning Machinery in India

Planning Commission was established in March 1950. The Commission was comprised of a number of members including Union Ministries, body of experts, administrators and housekeeping personnel which constitute its secretariat. Members may either be full time or part-time. For the 11th and 12th plans, for example, there are 11 members including the Prime Minister as Chairman, the Deputy Chairman, the Ministers, and others. There is, however, no fixed strength and the exact number of members may vary from time to time, depending upon several factors.

The Secretariat of the Commission includes three wings: (a) General Divisions, (b) Subject Divisions, and (c) House-Keeping Divisions. There are 29 divisions concerned with the studies related to the plan as a whole. These are:

1. Agriculture
2. Backward Classes Division
3. Communication & Information
4. Development Policy
5. Education
6. Environment & Forest
7. Financial Resources
8. Health, Nutrition & Family Welfare
9. Housing, Urban Development & Water Supply
10. Industry & Minerals
11. International Economic
12. Labor, Employment and Manpower
13. Multilevel Planning
14. Monitoring
15. Perspective Planning
16. Plan Coordination
17. Power & Energy
18. Program Evaluation Organization
19. Project Appraisal & Management
20. Rural Development
21. Science & Technology
22. Social Development & Women's Program
23. Social Welfare
24. State Plans Division
25. Transport
26. Village & Small Enterprises Division
27. Water Resources
28. Administration & Services
29. Other Units
    - Border Area Development Programs
    - Socio-Economic Research Unit
    - Western Ghat Development Program

There are branches which provides technical input to all the divisions of Planning Commission. These are: (i) Perspective Planning, (ii) Statistics and Surveys, (iii) Economic Research, (iv) Socioeconomic Research, (v) Plan Coordination, (vi) Program Administration, (vii) Multilevel Planning, (viii) Project and Information, (ix) Scientific Research, and (x) Plan Information and Publicity.

Subject division helps the Planning Commission in the formulation of the health programs and projects to be incorporated in the five year and annual plans and assist in evaluating performance. It carries out studies of special interest to health planning, e.g., number of medical colleges per population, or health manpower

requirement. The division works in close cooperation with the Ministry of Health & Family Welfare. The division seeks help of expert groups for preparation of the plan. The health plan is prepared by the division in collaboration with the Ministry of Health and Family Welfare. It is reviewed by the members of the Planning Commission and is integrated with the total plan. Planning Unit in the Ministry of Health and Family Welfare has the following functions:

(i) Compilation of national five-year health plan and supporting materials;
(ii) Development of strategy for getting plans accepted and financed;
(iii) Preparation of the central, annual health plan and discussions with the Planning Commission and the Ministry of finance;
(iv) Discussion and coordination with the state on matters relating to planning development and the financing and implementation of plans; and
(v) Submission of progress reports on planning schemes to the planning commission.

State Planning Boards have been set up in states of the country which prepare the draft state plans and other decisions by bringing about consultations between the experts, ministers, as well as seeking the views and demands of the district administration and other organizations. The planning board issues an 'Amended plan' after consulting with the plan advisory council of the state. The Planning Commission sends it to the National Development Council. The Council comprises of Prime Minister as the chairman and a senior dignitary as vice chairman, the Chief Ministers of States as members while the members of Planning Commission are its ex-officio members. Several Ministers of the Union government may also be invited by the chairman to attend the meetings as non-members. The decisions of the National Development Council along with the draft National Plan are sent to the Cabinets and Legislatures of all the Governments in the country for discussion who has final voice in regard to the nature and scope of plan as well as for the strategy and resources for its implementation. Cabinet and state legislatures send the approved plan and budget to the Parliament in central and State legislature in the state to make it the law (Figure 3.3).

NITI AAYOG (*National Institution for Transforming India*)

Background

India has undergone a paradigm shift over the past six decades - politically, economically, socially, technologically as well as demographically. The role of Government in national development has seen a parallel evolution. Keeping with these changing times, the Government of India has decided to set up NITI Aayog, in place of the erstwhile Planning Commission, as a means to better serve the needs and aspirations of the people of India. Prime Minister Mr. Narendra Modi in his first Independence Day speech in 2014, announced scrapping of Planning Commission. In 2015, he announced the formation of the NITI Aayog.

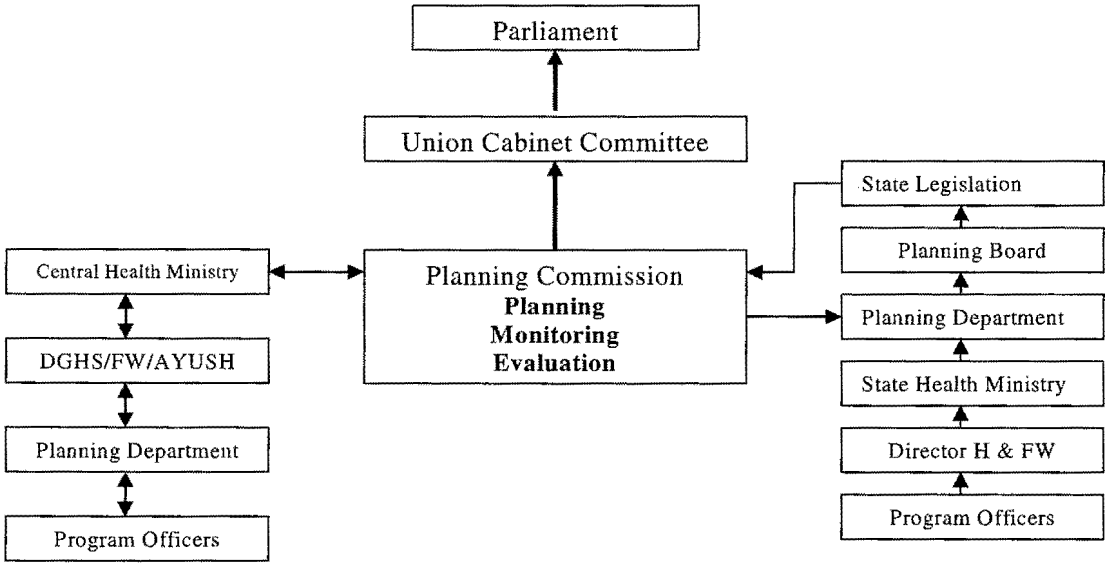


Figure 3.3: Planning Process in India

The institution serves as a 'think tank' of the government. It provides governments at the Central and State levels with relevant strategic and technical advice across the spectrum of key elements of policy. Instead of being in the controlling seat, it main function is to provide a direction. It is an 'enabler' instead of a 'provider of first and last resort'.

At the core of NITI Aayog's creation are two hubs
- Team India Hub
- Knowledge and Innovation Hub.

The Team India Hub leads the engagement of states with the Central government, thereby fosters Cooperative Federalism. An empowered role of States as equal partners in national development is called upon. The Knowledge and Innovation Hub builds NITI's think-tank capabilities.

Foundation

- The Cooperative Federalism.
- A knowledge hub of internal as well as external resources
- A collaborative platform facilitating Implementation; by monitoring progress, plugging gaps and bringing together the various Ministries at the Centre and in States, in the joint pursuit of developmental goals.

Structure

Chairman is Prime Minister of India with one Vice Chairman and three full time members. Ex-officio members are Ministers of Home affair, Minister of Information and Broadcasting, Minister of Finance, Minister of Corporate affair, Minister of Railways, Minister of Agriculture. There are three special invitee ministers and one chief executive officer.

Objectives

1) Fostering cooperative Federalism with active involvement of states
2) Formulation of plans at village level and aggregation at higher level
3) Special attention to the sections at risk of not benefitting adequately from economic progress
4) Economic policy that incorporates national security interest
5) Feedback for constant innovative improvements
6) Partnership with national and international think tanks
7) Creating a knowledge, innovation and entrepreneurial support system
8) Platform for resolution of inter-sectoral and inter-departmental issues
9) Focus on technology up gradation and capacity building

Functions of NITI Aayog

1. Cooperative and Competitive Federalism:

- Cooperative Federalism; enabling States to have active participation in the formulation of national policy, as well as achieving time-bound implementation of quantitative and qualitative targets through the combined authority of the Prime Minister and Chief Ministers.

2. Shared National Agenda:

- It means shared vision of national development priorities and strategies, with the active involvement of States. This will provide the framework 'national agenda' for the Prime Minister and Chief Ministers to implement.

3. State's Best Friend at the Centre:

- Support States in addressing their own challenges, as well as building on strengths and comparative advantages. This will be through various means, such as coordinating with Ministries, championing their ideas at the centre, providing consultancy support and building capacity.

4. Decentralized Planning:

- Restructure the planning process into a bottom-up model and empowering States, and guiding them to further empower local governments. Also, to formulate credible plans at the village level, which are progressively aggregated up the higher levels of government.

5. Vision & Scenario Planning:

- Design medium and long-term strategic frameworks of the big picture vision of India's future - across schemes, sectors, regions and time. It mean a fundamental transition from merely planning for where the Nation's money goes, to planning where we want the Nation to go.

6. Domain Strategies:

- Build a repository of specialized domain expertise, both sectoral and cross-sectoral; to assist Ministries of the Central and State

governments in their respective development planning as well problem solving needs. This will especially enable the imbibing of good governance best practices, both national as well as international.

7. ***Sounding Board:***
   - Be an in-house sounding board refining government positions, through objective criticisms and comprehensive counter-views.
8. ***Network of Expertise:***
   - Main-streaming external ideas and expertise into government policies and programmes through a collaborative community of national and international experts, practitioners and other partners. This would entail being Government's link to the outside world, roping in academia (universities, think tanks and research institutions), private sector expertise, and the people at large, for close involvement in the policy making process.
9. ***Knowledge and Innovation hub:***
   - Be an accumulator as well as disseminator of research and best practices on good governance, through a state-of-the-art Resource Centre which identifies, analyses, shares and facilitates replication of the same.
   - Atal Innovation Mission (AIM) including Self-Employment and Talent Utilization (SETU) has been set up to promote a culture of innovation and entrepreneurship. Its objective is to serve as a platform for promotion of world-class Innovation Hubs, Start-up businesses and other self-employment activities, particularly in technology driven areas.
10. ***Harmonization:***
    - Facilitate harmonization of actions across different layers of government, especially when involving cross-cutting and overlapping issues across multiple sectors; through communication, coordination, collaboration and convergence amongst all stakeholders. The emphasis will be on bringing all together on an integrated and holistic approach to development.
11. ***Conflict Resolution:***
    - Provide a platform for mutual resolution of inter-sectoral, inter-departmental, inter-state as well as centre-state issues.
12. ***Coordinating interface with the World:***
    - Be the nodal point for resources coming in from across nations, multi-lateral institutions and other international organisations, in India's developmental process.
13. ***Internal Consultancy:***
    - Offer an internal consultancy function to central and state governments on policy and program design. This would include specialised skills such as structuring and executing Public Private Partnerships.
14. ***Capacity building:***
    - To enable capacity building and technology up-gradation across government, benchmarking with latest global trends and providing managerial and technical knowhow.
15. ***Monitoring and Evaluation:***
    - To monitor the implementation of policies and programmes, and evaluate their impact; through rigorous tracking of performance metrics and comprehensive program evaluations.

COMMENTS

There are following factors which directly or indirectly affect health planning:

1. Low priority to health given by political leaders and decision makers;
2. Low budget allocation to health;
3. Lack of adequate health information system for planning and monitoring and ultimately for evaluation;
4. Natural resistance to change;
5. Frequent change of government, political and administrative staff and planners and names of institutions, programs and schemes;
6. Untrained personnel in Planning;
7. Traditional planning methods and not need-based, cost-effective, team-based and rational planning;
8. "Long Time" lag between planning and implementation;
9. Rigidity of budgeting, strategy, and administrative procedures; and
10. Inadequate coordination of planning.
11. Niti Ayog: Planning commission is established under the act of Parliament and played a significant role in planning of 5 years plans. Restructuring of the planning process is always welcome but renaming without much structural reform or

holistic approach may not be fruitful. Omitting certain key ministries such as Ministry of Health and Family Welfare, Ministry of Science and Technology, etc would not bring transformation of India.

There are many documents written by government bodies such as five year plan, National Health policy 2002, Women Empowerment policy, National Population Policy, RCH Programs, National Rural Health Mission, etc. The goal is same but there are different objectives, targets, and strategies. Such disparities may confuse the grass root level functionaries. In India, five year plans are religiously framed but seriously ignored.

As and when there is application for the fund from World Bank, DFID, or IMF there is pressure on project managers to structurally modify certain goals and objectives which differ from the national health goals.

References

Goal SL. Health Care System and Management (Vol. 3). New Delhi: Deep & Deep Publications Pvt. Ltd. 2001.

Govt. of India. 10th Five Year Plan. Planning Commission, Govt. of India, New Delhi.

Kishore J, Pay PC. Pioneering Social reformers of India. New Delhi: Wisdom Publications, 2002.

Kishore J. A Dictionary of Public Health. 3rd Edition. New Delhi: Century Publications 2013.

NITI Aayog. Govt of India. Available from : http://niti.gov.in/content/new_initiatives.php. Last accessed on 15th June, 2016.

WHO. Technical report Series No. 215, 1961.

CHAPTER 4

FIVE YEAR PLANS

INTRODUCTION

The Planning Commission of India is engaged in planning for various activities necessary for the fulfillment of the Constitutional requirement and agenda for individual ruling government since 1950. National Health Planning implies planning for the optimal use of scarce national resources that are available for health development.

Preparing National Health Plan is the responsibility of Ministry of Health & Family Welfare. During the process of planning various departments of the health and family welfare are asked to formulate their plan with broad objectives and action plan. A coordinating committee is chaired by Health Secretary, which compiles all plans and gives it a shape to make a suitable health plan. Various issues are discussed in meeting of Health Ministers of center and states and final draft is presented to the steering committee of Planning Commission. The National Development Council (NDC) is above the Planning Commission and the Government which has to approve the national agenda. Every state government has the right to decide on priority areas within the broad objectives laid down by the NDC.

HISTORY OF FIVE YEAR PLAN

FIRST FIVE YEAR PLAN

The first five year plan described conditions prevailing during the previous years and health humanpower was compared with United Kingdom, which was as follows:

*The Proportion of Medical Personnel to Population****

Medical Personnel	Per Population India	United Kingdom
1 Doctor	6,300*	1,000
1 Nurse	43,000	300
1 Health visitor	4,00,000	4,710
1 Midwife	60,000	618
1 Dentist	3,00,000	2,700
1 Pharmacist	40 lakh to 3 doctors.	

** 75 per cent. of doctors are in urban areas and their distribution in rural areas is very sparse.*

**** Report of the Health Survey and Development Committee.*

A program with the following priorities was formed:

i. Provision of water supply and sanitation.
ii. Control of malaria.
iii. Preventive health care of the rural population through health units and mobile units.
iv. Health services for mothers and children.
v. Education and training, and health education.
vi. Self-sufficiency in drugs and equipment.
vii. Family planning and population control.

Other Features

National Family Planning Program (1952)
National Malaria Control Program (1953)

National Water Supply and Sanitation Program (1954)
National Filaria Control Program (1955)
National Leprosy Control Program (1955)

SECOND FIVE YEAR PLAN

In its 32nd chapter, the general aim of health programs during the second five-year plan was to expand existing health services, to bring them within the reach of all the people and to promote a progressive improvement in the level of national health. The specific objectives were:

1. Establishment of institutional facilities to serve as bases from which services could be rendered to the people both locally and in surrounding territories;
2. Development of technical manpower through appropriate training programs and employment of persons trained;
3. The improvement of public health, institution of measures to control communicable diseases which could be widely prevalent in a community;
4. Active campaign for environmental hygiene; and
5. Family planning and other supporting programs for raising the standard of health of the people.

During the first two five year plans the basic structural framework of the public health care delivery system remained unchanged. Urban areas continued to get over three-fourth of the medical care resources whereas rural areas received 'special attention' under the Community Development Program (CDP).

Other features
National Venereal disease Control Program (1956)
National Malaria Eradication Program (1958)

THIRD FIVE YEAR PLAN

The Third Five Year Plan launched in 1961 discussed the problems affecting the provision of Primary Health Centers (PHCs), and directed attention to the shortage of health personnel, delays in the construction of PHCs, buildings and staff quarters and inadequate training facilities for the different categories of staff required in the rural areas. The Third Five Year Plan highlighted inadequacy of health care institutions, doctors and other personnel in rural areas as being the major shortcomings at the end of the second Five Year Plan. The doctor syndrome loomed large in the minds of planners, and increase in supply of human power in health meant more doctors and not other health personnel for them. While the third plan did give serious consideration to the need for more auxiliary personnel, no mention was made to reach this goal. Only lip service was done for the need of increasing auxiliary personnel but in reality, in training and establishment of institutions for these people, inadequate funding became the constant obstacle. On the other hand, the proposed outlays for new medical colleges, establishment of preventive and social medicine and psychiatric departments, completion of the All India Institute of Medical Sciences and schemes for upgrading departments in medical colleges for post graduate training and research, continued to be high.

The 3rd plan gave serious consideration for suggesting a realistic solution to the problem of insufficient doctors for rural areas. It was proposed that a new short term course for the training of medical assistants should be instituted. Those assistants who had worked for 5 years at a PHC could complete their education and training to become full fledged doctors and continue in public service. The Medical Council and the doctors lobby opposed this proposal.

In third five-year plan other major objective was to make as far as possible, supply of good drinking water in most villages of the country by the end of the Third Plan. Institutional facilities were expanded so that medical and health services reached progressively larger numbers of persons, especially in the rural areas. The program for the eradication of malaria was to be completed and in 1962 national programs for eradication of smallpox and to control tuberculosis and national goiter control program were started. In 1963 National trachoma control program was started. Drainage programs were undertaken on a larger scale in the urban areas.

FOURTH FIVE YEAR PLAN

In its 18th Chapter the planning commission had described the achievement during 3rd plan and set objectives for fourth plan. Those were: a) to provide an effective base for health services in rural areas by strengthening the primary health centers. These centers rendered preventive and curative health services, took over the maintenance phase of communicable diseases control programs for malaria

and smallpox and became the focal points for a nationwide family planning program. b) Sub divisional and district hospitals to be strengthened to serve as referral centers for Primary Health Centers. The campaigns against communicable diseases needed to be intensified. c) Medical and nursing education and training of paramedical personnel needed to be expanded to meet the minimum technical manpower requirements.

The 4th plan that began in 1969 with a 3-year plan holiday continued on the same lines as the 3rd plan. In fact the 4th plan is probably the most poorly written plan document. It does not even make a passing comment on the social, political and economic upheaval during the plan holiday period (1966-1969).

These 3 years of turmoil indeed brought about significant policy changes on the economic front and this was ignored completely in 4th plan. Family Planning continued to get an even greater emphasis with 42 per cent of health sector (Health + Family Planning) plan allocation going to it. It especially highlighted the fact that population growth was the central problem and used phrases like 'crippling handicap', 'very serious challenge' and an anti-population growth policy as an 'essential condition of success' to focus the government's attention to accord fertility reduction 'as a program of the highest priority'. It was also during this period that water supply and sanitation was separated and allocations were made separately under the sector of housing and regional development.

FIFTH FIVE YEAR PLAN

In its sixth chapter the plan emphasized on malaria eradication, leprosy and filarial control programs. Family welfare planning program was given a separate head. Similarly nutrition was allocated separate budget with applied nutrition program and mid day meal program. Urban development and water supply were also separated. Rs. 12000 per PHC and Rs. 2000 per Sub-center were allocated.

It was in the 5th plan that the government regretfully acknowledged the facts that despite advances made in terms of the infant mortality rate going down and life expectancy going up, the number of medical institutions, functionaries, beds, health facilities etc., were still inadequate in the rural areas. The government acknowledged that the urban health structure had expanded at the cost of the rural sectors. This awareness is clearly reflected in the objectives of 5th Five Year Plan which were as follow:

i. Increasing the accessibility of health services to rural areas.
ii. Correcting regional imbalances.
iii. Further development of referral services by removal of deficiencies in district/sub-divisional hospitals;
iv. Intensification of the control/eradication of communicable diseases especially malaria and smallpox;
v. Qualitative improvement in the education and training of health personnel; and
vi. Development of referral services by providing specialist attention to common diseases in rural areas.

The plan further envisaged that the delivery of health care services would be through a new category of health personnel to be specially trained as multipurpose health assistants. However, the infrastructure target still remained one PHC per CDP Block.

The **Kartar Singh Committee** in 1973 recommended the conversion of uni-purpose workers, including ANMs, into multi- purpose male and female workers. It recommended that each pair of such worker should serve a population of 10,000 to 12,000. Hence the multipurpose worker (MPW) scheme was launched with the objective of retaining the existing cadre of vertical program workers and to integrate the various vertical programs unto the primary health care package for rural areas.

Another major innovation in the health strategy was launched in 1977 by creating a cadre of village based health auxiliaries called the **Community Health Workers.** These were part time workers selected by the village, trained for 3 months in simple promotive and curative skills both in allopathy and indigenous systems of medicine. They were to be supervised by MPWs and the program was started in 777 selected PHCs where MPWs were already in place. The main recommendation of the committee was to have part-time health personnel selected by the community and should be from within the community. They would act

as a link between the MPW at the sub-centres and the community.

SIXTH FIVE YEAR PLAN

The Plan elaborated the achievement and declared freedom from smallpox in April 1977. The National Malaria Eradication Program initiated in 1958 had brought down the incidence of the disease to about 1 lakh cases with no deaths in 1965, although there has been a slippage in the subsequent years. The National Program for Control of Leprosy, Tuberculosis, Filaria and Blindness have also helped to reduce mortality and morbidity. National programs have also been initiated for promotion of maternity and child care such as immunization of expectant mothers against Tetanus and children against Tetanus, Whooping Cough, and Diphtheria. Tuberculosis, Polio etc., besides prophylaxis against Vitamin 'A' and iron deficiencies. Programs on improving the nutrition of mothers and children have also been taken up.

The **Sixth Plan** was, to a great extent influenced by the Alma Ata declaration of **Health For all by 2000 AD** and the ICSSR-ICMR report. It was also realized that it is this model which is depriving the rural areas and the poor people from the benefit of good health and medical services. The plan emphasized the development of a community based health system.

One of the most significant things that happened during the Sixth Plan was the adoption of the National Health Policy by both Houses of Parliament. Health Care Programs were restructured and reoriented towards this policy. Priority was given to extension and expansion of the rural health infrastructure through a network of community health centres, primary health centres and sub-centres, on a liberalized population norm. Efforts were made to develop promotive and preventive services, alongwith curative facilities. High priority was given to the development of primary health care located as close to the people as possible.

The scheme for Re-Orientation of medical education (ROME) was introduced with the objectives of (i) introducing community bias in the training of undergraduate medical students with emphasis on preventive and promotive services, (ii) reorientation of the role of medical colleges, so that they became an integral part of the health-care system and did not continue to function in isolation, (iii) reorientation of all faculty members so that hospital-based and disease-oriented training was progressively complemented by community-based and health-oriented training for providing comprehensive primary health care, and (iv) the development of effective referral linkages between PHCs, District Hospitals and Medical Colleges. The scheme had been implemented in its first phase, in about 106 medical colleges. In spite of a onetime grant-in-aid of about Rs. 16 lakhs to each of the participating institutions, the objectives of the scheme could not be achieved to the desired extent. This was largely due to (i) lack of commitment to the program at all levels, (ii) slow progress in the utilization of Central funds, and (iii) absence of efforts in the restructuring of teaching and training programs at the college levels.

In 1983-84 the National Guinea worm eradication program was launched and Leprosy control changed to eradication program.

SEVENTH FIVE YEAR PLAN

The Minimum Needs Program was continued to be the sheet-anchor for the promotion of the primary health measures, with greater emphasis on improvement in the quality of services rendered and on their outreach.

Health programs with effective coordination and coupling of health and health- related services and activities, e.g., nutrition, safe drinking water supply and sanitation, housing, education information and communication and social welfare were made as part of the package for achieving the goal of Health for All by 2000 AD. Emphasis on community participation and people's involvement and involvement of voluntary organizations for health education, qualitative improvements in health and family planning services, urban health services, school health services and mental and dental health services with special efforts to ensure comprehensive coverage was given.

For the control and eradication of communicable diseases, program implementation, strengthening of the National Goiter Control Programs, Cancer, coronary heart diseases, hypertension, diabetes, and traffic and other accidents emerging as major health problems, appropriate action for their control and containment were suggested.

Training and education of doctors and paramedical personnel needed special emphasis. Medical research of special relevance to the common health problems of the people, evaluation of intervention and technologies, modern biology and biotechnology were emphasized. The urgent need for effective and efficient management information system (MIS) was realized. The Indian systems of medicine need to be standardized and integrated. In 1985 Universal Immunization Program was started. In 1987 National AIDS Control Program was started.

EIGHT FIVE YEAR PLAN

It was realized that the human development cannot be achieved without health and population control. The Health for All (HFA) paradigm included not only high risk vulnerable groups, i.e., mothers and children, but must also focussed sharply on the underprivileged segments within the vulnerable groups. The government started Child Survival and Safe Motherhood Program in 1992. In 1992 National TB Control Program was reviewed. 73rd Constitutional Amendment led to formation of Panchayati Raj Institutions.

Under the minimum need program rural health services were given priority. Three tier system of rural health care was further strengthened for optimum utilization. The facilities should have essential equipments, drugs and manpower and reorganization of the Indian Systems of Medicine and Homeopathy (ISM&H) dispensaries/hospitals in rural areas to create ISM&H health centres was suggested. Panchayati Raj system was revamped eliciting community participation in the health program and providing supervision and support to primary health care infrastructure.

Urban Health Services: Assurance to take serious attempts in developing urban health services as per the recommendations of Krishnan Committee was made. Strengthening of secondary and tertiary care centers was emphasized to support urban health centers.

Health Manpower Development and Training: shortage of nurses, pharmacists, laboratory technicians, radiographers, dental surgeons, etc., in the country was highlighted. The approach and strategy for health manpower development during the Eighth Plan by bringing a National Policy on Education in Health Sciences and also check on the undue emphasis on specialization/super specialization. Continuing education for all categories of staff through district and regional level training institutions, medical colleges, Indian Medical Association (IMA) and National Academy of Medical Sciences (NAMS) was also emphasized. Need for uniform standards of medical and paraprofessional education had been recognized. Efforts for reorientation of medical education, started during the earlier plans, were also suggested.

Programs for Control of Communicable and noncommunicable Diseases: Need for surveillance, IEC and integration and coordination with other sectors was emphasized. Vector borne diseases, kala-azar, diarrheal disease program, leprosy eradication, tuberculosis control, blindness control program, cancer control, iodine deficiency disorders control program, guinea worm eradication, AIDS control program, diabetes control, accident prevention, mental health were emphasized. Special emphasis on medical research in Indian System of Medicine and Homoeopathy, was given.

NINTH FIVE YEAR PLAN

New Initiatives under the plan were:

- Horizontal integration of vertical programs
- Develop disease surveillance and response mechanism with focus on rapid recognition, report & response at district level
- Develop & implement integrated non-communicable disease control program
- Health Impact Assessment as a part of environmental impact assessment in developmental projects.
- Implement appropriate management systems for emergency, disaster, accident & trauma care at all levels of health care.
- Improve HMIS and logistics of supplies
- RNTCP, enhanced malaria control project and RCH-1 were started in 1997.

TENTH FIVE YEAR PLAN

The Tenth Five-Year Plan aimed at stepping up the growth rate of GDP to 8 per cent per annum over the plan period 2002-2007. It also proposed to establish specific monitorable targets covering economic, social and environmental dimensions of human development. These included targets on reduction in poverty ratio;

access to primary education; raising literacy rate; decline in infant mortality rate and maternal mortality rate; raising employment growth rate; improving coverage of villages in terms of access to potable drinking water; reducing gender gaps in literacy and wage rates; cleaning of major polluted river stretches; increase in forest cover; and reducing the decadal population growth rate.

Health

India is continued commitment to provide: a) essential primary health care, emergency life saving services, services under the national disease control programs and the national family welfare program totally free of cost to all individuals; and b) essential health care service to people below poverty line based on their need and not on their ability to pay for the services. This was done by the appropriate interventions to ease the existing funding constraints at all levels of health system and to promote the complete and timely utilization of allocated fund.

Focus

- Reorganization and restructuring the existing government health care system including the Indian System of Medicine & Homeopathy (ISM & H) infrastructure at the primary, secondary and tertiary care levels with appropriate referral linkages for well defined geographical area.
- Development of appropriate two-way referral systems utilizing information technology (IT) tools to improve communication, consultation and referral right from primary care to tertiary care level.
- Building up an efficient and effective logistics system for the supply of drugs, vaccines and consumables.
- Horizontal integration of all aspects of the current vertical programs including supplies, monitoring, IEC and motivation, training, administration arrangements and implementation so that they are integral components of health care.
- Improvement in the quality of care at all levels.
- Transparent norms for quality and cost of care.
- Quality of education of health professionals and paraprofessionals.
- Skill upgradation of all health care providers through Continuing Medical Education and reorientation programs.
- Research and development to solve major health problems and emerging diseases.
- Health Management Information System (HMIS) using current IT tools.
- Effective system of disease surveillance and response at all levels.
- Strengthening and sustaining civil registration, sample registration system, and improving medical certification of death.
- Building up appropriate linkage between government, private and voluntary sectors.
- Mainstreaming ISM&H practitioners to improve coverage of the national disease control programs and family welfare program.
- Involvement of voluntary and private organizations, self-help groups and social marketing organization to improve access to health care.
- Improving intersectoral coordination.
- Devolution of responsibilities and funds to Panchayati Raj Institutions (PRIs).
- Strengthening programs to assess health impact as the part of environmental impact assessment of all development projects.
- Improving the safety of the work environment in organized and unorganized industries and agriculture.
- Developing capabilities at all levels, for emergency and disaster prevention and management.
- Food and drug safety.
- Screening for common nutritional deficiencies especially in vulnerable groups and initiating appropriate remedial measures.

Following areas were highlighted:

- Health care system
- Development and use of appropriate technologies
- Public private partnership in health care
- Quality and accountability in health care
- Health manpower development
- National health programs
- Health Management Information System (HMIS)
- Infection control and waste management in health care settings
- Horizontal integration of vertical programs
- Prevention and management of noncommunicable diseases
- Environmental health
- Occupational health

- Drugs –production, quality and supply
- Information, Education, Communication and Motivation
- Public health
- Health systems research and biomedical research
- Health care financing
- National Vector Borne Disease Control (2004)
- Integrated Disease Surveillance Project (2004)
- National Rural Health Mission (2005)

Reduction in fertility, mortality and population growth rate was major objective of the tenth plan. Monitorable targets of RCH to achieve significant improvement in quality of life of the citizens by 2020 were emphasized:

IMR	Reduction by 2007	45/1000 live births
	Reduction by 2012	28/1000 live births
MMR	Reduction by 2007	2/1000 live births
	Reduction by 2012	1/1000 live births

Decadal Growth Rate 2001-2011 16.2

Vision 2020 for India

The Planning Commission has initiated work on preparing a National Vision 2020 document. It has also offered to assist the state governments in preparing a Vision 2020 document in order to have a perspective plan for the development of the States for the next 20 years or so.

ELEVENTH FIVE YEAR PLAN

A Comprehensive Strategy for Better Health

The 10th Plan aimed at providing essential primary health care, particularly to the underprivileged and underserved segments of Indian population. It also sought to devolve responsibilities and funds for health care to Panchayati Raj Institutions (PRIs). However, progress towards these objectives has been slow and the targets on MMR & IMR have been missed. Accessibility remained a major issue especially in areas where habitations were scattered and women & children continue to die en route to hospitals. Rural health care in most states is marked by absenteeism of doctors/health providers, low levels of skills, shortage of medicines, inadequate supervision/ monitoring and callous attitudes. There are neither rewards for service providers nor punishments for defaulters. As a result, health outcomes in India are adverse compared to bordering countries like Sri Lanka as well as countries of South East Asia like China and Vietnam.

Achievement of health objectives involves much more than curative or even preventive medical care. It needs a comprehensive approach which encompasses individual health care, public health, sanitation, clean drinking water, access to food and knowledge about hygiene and feeding practice. This is a difficult area because of the sociocultural complexities and also regional diversity. Policy interventions therefore have to be evidence based and responsive to area specific differences. With concerted action including enabling pregnant women to have institutional deliveries and receive nutritional supplements; connecting PHCs and CHCs by all weather roads so that they can be reached quickly in emergencies; (accessibility to hospital should be measured in terms of travel time, not just distance from nearest PHC); providing home-based neo natal care including emergency life saving measures etc., India can be on track to reach the Millennium Development Goals for IMR, MMR and for combating diseases by the end of the 11th Plan.

To improve the primary health care system, the 11th Plan had first lay emphasis on integrated district health plans and second, on block specific health plans. These plans support to ensure involvement of all health related sectors and emphasized partnership with NGOs. The NRHM has already been launched to ensure quality health care in rural areas. The next step envisaged to extend this to make it a Sarva Swasthya Abhiyan that also cover the health needs of the urban poor, particularly the slum dwellers by investing in high caliber health professionals and appropriate technology.

Besides reducing the burden and the level of risk of existing, growing and emerging diseases, the 11th Plan had also taken care of the special needs of people who were HIV positive, particularly women. The 11th Plan recognized the feminine face of HIV and accorded it the highest priority.

The 11th Plan continued to advocate fertility regulation through voluntary and informed consent. It also addressed the special healthcare needs of the elderly, especially those who are economically and socially vulnerable.

(a) National Rural Health Mission

A seven year National Rural Health Mission (NRHM), which spans the duration of the 11th Plan, has been launched to address infirmities and problems across rural primary health care. Converging the public health approach with primary health care has been one of the primary objectives of this mission. Another objective is to genuinely empower and support Panchayati Raj Institutions (PRIs) to manage, administer, and be accountable for health services at community levels. Supervision of health sub-centers by gram panchayats were expected to improve attendance of staff, motivate appropriate quality of care and provide constant feedback on patient satisfaction. The NRHM also converge the management of health delivery across all systems of medicine (including ISM) at primary health care levels.

Plan recommended a strong case for reintroducing the 2 year licentiate course in medicine which existed earlier but was abolished. It was suggested that India needs to devise ways of training and accrediting the rural health providers (popularly called RMPs) and permitting them to provide selected services under the supervision of a licensed medical practitioner.

(b) Disability and Mental Health

Coping with challenges of living in a rapidly developing society and increasing exposure to a violent world has led to a perceptible increase in mental stress. Provision of mental health care is thus vital. From the children of farmers who commit suicide to victims of violence, calamities and sexual abuse, all need counseling support. Yet this has been a much neglected area in India. Even today there is a stigma attached to mental illness which prevents many from reaching out. The 11th Plan recognized the importance of mental health care and suggest providing counseling, medical services and establishing helplines for all-especially people affected by calamities, riots and violence. Adequate budgetary provisions was suggested for this purpose.

The 2001 Census reveals that 2.13% of Indian population or approximately 2.19 crore people in India suffer from severe disability. The 11th Plan recommended special measures to not just prevent discrimination against the disabled, especially children with disability, but also introduce policies to empower them and enable them to lead a life of dignity. The Persons with Disability (Equality Opportunities, Protection of Rights & Full Participation) Act, 1995 which provides various entitlements to persons with disability recognized to effectively operationalized.

(c) Financing Health Services

Energizing health systems involves additional government expenditure. The existing level of government expenditure on health in India is just under 1 percent which is unacceptably low and effort should be made to increase the total expenditure at the Centre and the states to 2-3% of GDP (Table 4.1). This must be accompanied by innovative financing mechanisms which incentives performance. The quality of publicly

Table 4.1: Pattern of Central Allocation of Funds and expenditure on health

Plan	Out of total Investment Outlay (%)			Total	Health Expenditure	Per capita Rs.
	Health	Family Welfare	AYUSH		as % of GDP	Public Ex Health
First Plan	3.3	0.1	-	3.4	0.22	0.61
Second Plan	3.0	0.1	-	3.1	0.49	1.36
Third Plan	2.6	0.3	-	2.9	0.63	2.48
Fourth Plan	2.1	1.8	-	3.9	0.61	3.47
Fifth Plan	1.9	1.2	-	3.1	0.74	6.22
Sixth Plan	1.8	1.3	-	3.1	0.81	11.15
Seventh Plan	1.7	1.4	-	3.1	0.91	19.37
Eight Plan	1.7	1.5	0.02	3.2	1.05	38.63
Ninth Plan	2.31	1.76	0.03	4.02	0.96	64.83
Tenth Plan	2.09	1.83	0.05	3.97	0.88	112.21
Eleventh Plan	6.3	merged with Health	0.18	6.5	0.91 (03-04)	214.62
Twelveth Plan					1.4	

supplied healthcare depends on how healthcare providers are paid. Providers should be paid only if they actually perform a service or satisfy the customer (the patient or the village health committee). Such systems linking payment to performance was recommended in the plan.

The 11th Plan experimented with different systems of private-public partnership, of which many examples already exist in some states. Plan suggested to explore the possibility of an entitlement system for pregnant women to have professionally supervised deliveries. It was expected to empower them to exercise choice, as well as create competition in the health service sector. Contracting out well-specified and delimited projects such as immunization can help enhance accountability.

Studies across the country have shown that expenditure on healthcare is a primary cause of indebtedness. Due to inadequate and nonperforming public health infrastructure, the poor are forced to approach private practitioners who charge exorbitant fees. It is thus vital to ensure access to functioning public sector healthcare facilities. Experience has shown that severe ill health can lead to disastrous outcomes for individuals and their families especially for the poor. These problems are best handled by health insurance.

Community Based Health Insurance (CBHI) is emerging as a promising concept and existing experience in different states has shown that well managed prepayment systems with risk pooling are effective in protecting the poor from impoverishment due to high medical costs during catastrophic health events. CBHI initiatives based on some individual contributions to the premium, plus a government subsidy, were recommended to improve the quality of healthcare and expand the healthcare interventions as per requirements. it is also recommended to look at alternative approaches such as comprehensive risk pooling packages through the public system and through accredited private providers.

(d) *Clean Water for All*

Waterborne infections hamper absorption of food even when intake is sufficient. Clean drinking water is therefore vital to reduce the incidence of disease and to check malnutrition. The 10th Plan target of providing potable drinking water to all villages has not been achieved. Under Bharat Nirman, it was planned to cover the 55067 uncovered habitations in 4 years (2005-09). Rural Water Supply is, however, beset with the problem of sustainability, maintenance, and water quality. Thus though more than 95% coverage was achieved prior to Bharat Nirman, 2.8 lakh out of the 14.22 lakh habitations in the country, have slipped back from fully covered to partially covered status. Another 2.17 lakh habitations have problems with the quality of water; about 60,000 habitations face serious problems of salinity or arsenic and fluoride contamination. These habitations were planned taken up under Bharat Nirman. The 11th Plan to be emphasizes full and timely realization of the Bharat Nirman targets.

The 11th Plan also addressed issues of sustainability by moving away wherever possible from ground water to surface water resources. Where alternate sources did not existed, or were not cost effective, ground water recharge measures were insisted upon in the vicinity of the project. The Plan moved away from state implemented and managed projects to encourage community owned and managed projects, like the Swajaldhara Program. In the 10th Plan, Swajaldhara had a limited provision of 20% of the allocation of the Accelerated Rural Water Supply Program (ARWSP). It was upscaled so that more and more schemes are community managed, reducing the maintenance burden and responsibility of the state.

(e) *Sanitation*

Rural sanitation coverage was only 1% in the 1980s. With the launch of the Central Rural Sanitation Program in 1986, the coverage improved to 4% in 1988 and then increased to 22% in 2001. The program was modified as Total Sanitation Campaign in 1999 changing the earlier supply driven, high subsidy and departmentally executed program to a low subsidy, demand driven one, with emphasis on hygiene education. Five hundred and forty districts were covered under this program and the population coverage was expected to increase to about 35% by the end of the 10th Plan.

Lack of sanitation is directly linked to a number of

waterborne diseases. It is now generally acknowledged that unless 100% coverage of the community is achieved and proper solid waste management carried out, health indicators will not show significant improvement. Besides, toilets are essential for the dignity and safety of girls and women. The subsidy regime in the current program was only for BPL families. For full coverage to be achieved however, APL families were motivated to switch over from open defecation to use of toilets. The Information, Education, and Communication (IEC) campaign received increased attention in the 11th Plan. Meanwhile, the cost norms for individual household toilets were revised and a solid waste management component was being included in the program. These measures coupled with a focused IEC campaign were significantly increased sanitation coverage in the 11th Plan.

Steps are also being taken to link rural sanitation with the rural health mission. The Nirmal Gram Puraskar, a reward scheme for 100% open defecation free communities has been a motivating factor and is picking up momentum as can be seen from the number of communities competing for the Puraskar. With sufficient allocation of funds in the 11th Plan, the MDG goal for sanitation were expected to be met by 2010, and full coverage achieved between 2012 and 2015.

Achievements

The Eleventh Plan had laid emphasis on more budget allocation to provide better services to decrease infant mortality (IMR), and maternal mortality (MMR), to increase institutionalized delivery, extent of full immunization, etc. The Infant mortality Rate (IMR) has fallen from 57 in 2006 to 50 in 2009. Deliveries (%) in institutions have increased from 54 in 2006 to 73 in 2009, while the Maternal Mortality Rate (MMR) has come down by 32 points to 212 (2007 2009). The pace of progress in these areas in the Twelfth Plan should continue.

Failures

Financing has not increased more than 1.4% of GDP as envisaged by the 11th plan. Universal Clean water supply was not achieved which is key to control communicable diseases. Sanitation remain a distant dream for most of the rural and urban slum population. Mental health and disability limitation should have recieved priority but no major change in program strategy and expansion to more districts was seen. Most of the targets set for the plan were not completely realized.

Bharat Nirman

Bharat Nirman is a time-bound business plan for action in rural infrastructure over the four year period (2005-2009). Under Bharat Nirman, action is proposed in the areas of irrigation, rural roads, rural housing, rural water supply, rural electrification and rural telecommunication connectivity. Specific targets have been set under each of these goals as under:

- **Irrigation** - to create 10 million hectares of additional irrigation capacity
- **Rural roads** - to connect all habitations (66802) with population above 1000 (500 in hilly/ tribal areas) with all weather roads
- **Rural housing** - to construct 60 lakh houses for rural poor
- **Rural water supply** - to provide potable water to all uncovered habitations (55067) and also address slipped back and water quality affected habitations
- **Rural electrification** - to provide electricity to all un-electrified villages (1,25,000) and to connect 23 million households below the poverty line
- **Rural telephony** - to connect all remaining villages (66822) with a public telephone while the agenda is not new, the effort is to impart a sense of urgency to these goals, make the program time bound, transparent and accountable. The funding for the program will be met through an appropriate mix of budgetary support by the Centre and states, external aid, market borrowing and a separate window under RIDF for rural roads.

TWELVETH PLAN

The Planning Commission was set up in March, 1950 by a Resolution of the Government of India. The health system of India is based on planning through its five-year plans, developed, executed and monitored by the Planning Commission. The review of 11th five year plan revealed following weaknesses in the Indian healthcare system.

- Availability of health care services from the public and private sectors taken together is quantitatively inadequate.
- Quality of healthcare services varies considerably in both the public and private sector. Regulatory standards for public and private

hospitals are not adequately defined and are ineffectively enforced.

- Affordability of health care is a serious problem for the vast majority of the population, especially in tertiary care. The lack of extensive and adequately funded public health services leads to high out of pocket expenditure.
- The total expenditure on health care in India, taking both public, private and household out-of-pocket (OOP) expenditure was about 4.1 per cent of GDP in 2008–09. Public expenditure on Core Health (both plan and non-plan and taking the Centre and States together) was about 1.04 per cent during 2011–12 which is very less. The increase in Central expenditures has not been fully matched by a comparable increase in State Government expenditures.
- The 11th Plan had set six health outcome indicators as time- bound goals. These included lowering maternal and infant mortality, malnutrition among children, anemia among women and girls, and fertility, and raising the child sex ratio. Though, there has been progress on all these fronts, except child sex ratio, the goals have not been fully met.
- Growing reliance on private providers, which currently service 78% of outpatients and 60% of in-patients. For those who cannot afford private services, illness translates into high out-of-pocket expenditure as a proportion of total household expenditure.

Twelfth plan strategy

The Twelfth Plan seeks to strengthen initiatives taken in the Eleventh Plan to expand the reach of health care and work towards the long term objective of establishing a system of Universal Health Coverage (UHC) in the country.

Outcome indicators for Twelfth Plan

1. ***Reduction of Infant Mortality Rate (IMR) to 25***: At the recent rate of decline of 5 per cent per year, India is projected to have an IMR of 36 by 2015 and 32 by 2017. An achievement of the MDG of reducing IMR to 27 by 2015 would require further acceleration of this historical rate of decline. If this accelerated rate is sustained, the country can achieve an IMR of 25 by 2017.
2. ***Reduction of Maternal Mortality Ratio (MMR) to 100***: At the recent rate of decline of 5.8 per cent per annum India is projected to have an MMR of 139 by 2015 and 123 by 2017. An achievement of the Millennium Development Goal (MDG) of reducing MMR to 109 by 2015 would require an acceleration of this historical rate of decline. At this accelerated rate of decline, the country can achieve an MMR of 100 by 2017.
3. ***Reduction of Total Fertility Rate (TFR) to 2.1***: India is on track for the achievement of a TFR target of 2.1 by 2017.

Table 4.2: National Health Goals for Communicable Diseases

Disease	Twelfth Plan Goal
Tuberculosis	Reduce annual incidence and mortality by half
Leprosy	Reduce prevalence to <1/10000 population and incidence to zero in all districts
Malaria	Annual malaria Incidence of <1/1000
Filariasis	<1 per cent microfilaria prevalence in all districts
Dengue	Sustaining case fatality rate of <1 per cent
Chikungunya	Containment of outbreaks
Japanese Encephalitis	Reduction in mortality by 30 per cent
Kala-azar	Elimination by 2015, that is, <1 case per 10000 population in all blocks
HIV/AIDS	Reduce new infection to zero and provide comprehensive care and support to all persons liviing with HIV/AIDS and treatment services for all those who require it.

4. ***Prevention and reduction of under-nutrition in children under 3 years to half of NFHS-3 (2005–06) levels***: At the current rate of decline, the prevalence of under-weight children is expected to be 29 per cent by 2015, and 27 per cent by 2017. An achievement of the MDG of reducing undernourished children under 3 years to 26 per cent by 2015 would require an acceleration of this historical rate of decline. The country needs to achieve a reduction in below 3 year child under-nutrition to half of 2005–06 (NFHS) levels by 2017.
5. ***Prevention and reduction of anaemia among women aged 15–49 years to 28 per cent***
6. ***Raising child sex ratio*** in the 0–6 year age group from 914 to 950.
7. ***Prevention and reduction of burden of Communicable and Non-Communicable diseases (including mental illnesses) and injuries***: The national goals are shown in Table 4.2.
8. ***Reduction of poor households' out-of-pocket expenditure:*** Increase in public health spending to 1.87 per cent of GDP by the end of the Twelfth Plan. Twelfth Plan aim to reduce out-of-pocket spending as a proportion of private spending on health.

Focus areas in 12th Five year plan

- Access to services: Barriers to access would be recognised and overcome especially for the disadvantaged and people located far from facilities. Medical and public health facilities would be accessible to the differently-abled. They would be gender sensitive and child friendly.
- Special services: Special services should be made available for the vulnerable and disadvantaged groups. For example, counselling of victims of mental trauma in areas of conflict, or the supply and fitting of aids for the differently-abled.
- Representation in community fora: Wherever community-level fora exist or are being planned for, such as Rogi Kalyan Samitis, VHSNC, representation of the marginalised should be mandatory. Also, every Village Health Sanitation and Nutrition Committee would strive to have 50 per cent representation of women.
- Training of health and rehabilitation professionals should incorporate knowledge of disability rights.

Universal health coverage

The High Level Expert Group has defined UHC as follows: 'Ensuring equitable access for all Indian citizens in any part of the country, regardless of income level, social status, gender, caste or religion, to affordable, accountable and appropriate, assured quality health services (promotive, preventive, curative and rehabilitative) as well as services addressing wider determinants of health delivered to individuals and populations, with the Government being the guarantor and enabler, although not necessarily the only provider of health and related services.'

Recommendations of High Level Expert Group on Universal Health Coverage

1. Health Financing and Financial Protection: Government should increase public expenditure on health from the current level of 1.2 per cent of GDP to at least 2.5 per cent by the end of the Twelfth Plan, and to at least 3 per cent of GDP by 2022. General taxation should be used as the principal source of healthcare financing, not levying sector specific taxes. Specific purpose transfers should be introduced to equalise the levels of per capita public spending on health across different states. Expenditures on primary healthcare should account for at least 70 per cent of all healthcare expenditure. The technical and other capacities developed by the Ministry of Labour for the RSBY should be leveraged as the core of UHC operations—and transferred to the Ministry of Health and Family Welfare.
2. Access to Medicines, Vaccines and Technology: Price controls and price regulation, especially on essential drugs, should be enforced. The Essential Drugs List should be revised and expanded, and rational use of drugs ensured. Public sector should be strengthened to protect the capacity of domestic drug and vaccines industry to meet national needs.
3. Human Resources for Health: Institutes of Family Welfare should be strengthened and Regional Faculty Development Centres should be selectively developed to enhance the availability of adequately trained faculty and faculty-sharing across institutions. District Health Knowledge Institutes, a dedicated training system for Community Health Workers, State Health

Science Universities and a National Council for Human Resources in Health (NCHRH) should be established.

4. Health Service Norms: A National Health Package should be developed that offers, as part of the entitlement of every citizen, essential health services at different levels of the healthcare delivery system. There should be equitable access to health facilities in urban areas by rationalising services and focusing particularly on the health needs of the urban poor.
5. Management and Institutional Reforms: All India and State level Public Health Service Cadres and a specialised State level Health Systems Management Cadre should be introduced in order to give greater attention to Public Health and also to strengthen the management of the UHC system. The establishment of a National Health Regulatory and Development Authority (NHRDA) a, National Drug Regulatory and Development Authority (NDRDA) and a, National Health Promotion and Protection Trust (NHPPT) is also recommended.
6. Community Participation and Citizen Engagement: Existing Village Health Committees should be transformed into participatory Health Councils.
7. Gender and Health: There is a need to improve access to health services for women, girls and other vulnerable genders (going beyond maternal and child health).

Healthcare financing

For financing the Twelfth Plan the projections envisage increasing total public funding, plan and non-plan, on core health from 1.04 per cent of GDP in 2011–12 to 1.87 per cent of GDP by the end of the Twelfth Plan. In such an event, the funding in the Central Plan would increase to 3 times the Eleventh Plan levels involving an annual increase by 34 per cent. Other models of financing like public private partnership to be promoted. RSBY coverage to be expanded (Table 4.3).

Drug regulation

E-governance systems that inter-connect all licensing and registration offices and laboratories, GPS based sample collection systems and online applications for licensing would be introduced. The MoHFW would ensure that irrational Fixed Dose Combinations (FDCs) and hazardous drugs are weeded out in a time bound manner. Pharmaco-vigilance, post-marketing surveillance, Adverse Drug Response Monitoring, quality control, testing and re-evaluation of registered products would be accorded priority under drug regulation. Use of generic names or the International Non-proprietary Name (INN) would be made compulsory and encouraged at all stages of Government procurement, distribution, prescription and use. The Drugs and Cosmetics Act would be amended

Table 4.3: Budget Support for Departments of MoHFW in Twelfth Plan (2012-17)

(Figure in ₹ Crores)

Budget Support for Central Departments in Eleventh Plan (2007-12) and Twelfth Plan (2012-17) – Projection (₹ Crores)			
Department of MoHFW	Eleventh Plan Expenditure	Twelfth Plan Outlay	% Increase
Department of Health and Family Welfare	83,407	2,68,551	322%
Department of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homoeopathy (AYUSH)	2,994	10,044	355%
Department of Health Research	1,870	10,029	536%
Aids Control	1,305	11,394	873%
Total MoHFW	89,576	3,00,018	335%

Table 4.4: Percentage shortfall of health professionals in India

	Availability (2011–12)*	Desired density†	Need based on desired density	Percentage shortfall (%)
Doctors	691633	85	1031383	49·1%
AYUSH practitioners	534091	49	594562	11·3%
Dentist	88370	15	182009	106·0%
Pharmacist	492923	70	849374	72·3%
Nurses or general nursing and midwifery	743324	170	2062765	177·5%
Auxiliary nurse midwives	361879	85	1031383	185·0%

Source: Twelfth Five Year Plan (2012–17).[79] AYUSH=Ayurveda, Yoga and naturopathy, Unani, Siddha, Homoeopathy practitioners. *Availability excludes the 25% of doctors, AYUSH, pharmacists, and dentists and the 40% of nurses and auxiliary nurse midwives enrolled for training to account for attrition. †Desirable density is number of health personnel per 100 000 population as per Twelfth Five Year Plan.

Source: Patel V, et al. Lancet 2015; 386: 2422-35

to include medical devices incorporating provisions for their risk-based classification, clinical trials, conformity assessments and penalties.

Food regulation

The newly established Food Safety and Standards Authority of India (FSSAI) would strive to improve transparency in its functioning and decision making. Bio-safety would be its integral part. Food surveys would be carried out regularly and their results made public. An annual report on state of food safety would be published. Policies to promote production and consumption of healthy food would be developed. An appropriate module on food safety and bio-safety will be introduced in the Medical and Nursing curriculum.

Regulation of medical practice

Govt will consider mandating evidence based and cost-effective clinical protocols of care, which all providers would be obliged to follow. The rights of patients to obtain rational treatment of good quality at reasonable cost would be protected. All States will be persuaded to adopt the Central Act under Clause (1) of Article 252 for clinical establishment of the Constitution. An appropriate regulatory mechanism would be considered to ensure compulsory rural service by medical graduates.

National level tertiary care institutions

A single Central Sector Scheme on 'National Level Tertiary Care Institutions' will fund up-gradation of existing medical colleges and converting tertiary care facilities of the Central Government across different departments into teaching institutions. In the Twelfth Five Year Plan a concerted effort needs to be made to confer greater autonomy to the existing Tertiary Care Institution and Hospitals. More AIIMS like Institutions (ALIs) will be established during the Twelfth Plan period in addition to the eight already approved. Centers of Excellence to be created for training public health professionals in epidemiology, entomology and microbiology for effective disease surveillance, disease outbreak investigations.

There is shortfal of health professional in India and huge maldistribution in rural and urban areas (Table 4.4). Therefore a new category of mid-level health-workers named Community Health Officers, could be developed for primary health care. These workers would be trained after Class XII for a three year period to become competent to provide essential preventive and primary care and implement public health activities at sub-centre level. The National Commission for Human Resources and Health (NCHRH) would be created as an overarching regulatory body for medical education and allied health sciences with the dual purpose of reforming the current regulatory framework and enhancing the supply of skilled human resource in the health sector. The proposed Commission would subsume many functions of the existing councils, namely Medical Council of India,

Dental Council of India, Nursing Council of India and Pharmacy Council of India.

Information technology in health

A composite Health Information System will be developed which will incorporate the following:

1. Universal registration of births, deaths and cause of death with maternal and infant death reviews.
2. Nutritional surveillance, particularly among women in the reproductive age group and children under six years of age.
3. Disease surveillance based on reporting by service providers and clinical laboratories (public and private) to detect and act on disease outbreaks and epidemics.
4. Out-patient and in-patient information through Electronic Medical Records (EMR) to reduce response time in emergencies and improve general hospital administration.
5. Data on Human Resource within the public and private health system
6. Financial management in the public health system to streamline resource allocation and transfers, and accounting and payments to facilities, providers and beneficiaries.
7. A national repository of teaching modules, case records for different medical conditions in textual and audio-visual formats for use by teaching faculty, students and practitioners for Continuing Medical Education.
8. Tele-medicine and consultation support to doctors at primary and secondary facilities from specialists at tertiary centres.
9. Nation-wide registries of clinical establishments, manufacturing units, drug-testing laboratories, licensed drugs and approved clinical trials to support regulatory functions of Government.
10. Access of public to their own health information and medical records, while preserving confidentiality of data.
11. Programme Monitoring support for National Health Programs.

To achieve these goals, computer with internet connectivity would be ensured in every PHC and all higher level health facilities.

National Health Mission (NHM)

Major component of NHM is proposed to be a Scheme for providing primary health care to the urban poor, particularly those residing in slums. NHM would give the States greater flexibility to make multi-year plans for systems strengthening, and addressing threats to health in both rural and urban areas through interventions at Primary, Secondary and Tertiary levels of care. It will cover the entire health sector, be subject to rigorous monitoring, and linked to a performance based appraisal and incentive system. In addition to the Common Review Mission, a methodology of external concurrent evaluation would be finalised and put in place to assess the progress.

National AIDS Control Organisation

The program strategy would be two pronged: intensification of interventions for high risk groups and bridge populations, and integration of prevention (including mother to child transmission), testing, counselling and treatment services among the general population, including pregnant women, with the routine RCH program. To achieve mainstreaming of services, the State AIDS Control Societies and District AIDS Prevention and Control Unit (DAPCU) will be linked with the National Health Mission structure at these levels. The primary goal of NACP during Twelfth Plan will be to accelerate the process of reversal and further strengthen the epidemic response in India through a well-defined, integration process. The program will be further strengthened and programme management capacities decentralized to state and district levels.

Indian systems of medicine and homoeopathy services (AYUSH)

Practice and promotion of AYUSH in the States would be carried out under the broad umbrella of the National Health Mission. A revamped National Program Coordination Committee of the National Health Mission with Secretaries of all the departments under the MoHFW, and chaired by Secretary Health, would provide the funding and program guidance for convergence and mainstreaming of AYUSH. The concept of AYUSH Gram will be promoted, wherein one village per block will be selected for implementation of integrated primary care protocols of AYUSH and modern system of medicine. In these villages, herbal medicinal gardens will be supported, regular Yoga camps will be organised, preferably through PRI institutions and youth clubs. Research and human resource development will be promoted.

The Department of AYUSH would develop standards for facilities at the primary, secondary and tertiary levels as a part of IPHS; Standard Treatment Guidelines and a Model Drugs List of AYUSH drugs for community health workers will be developed. A National Institute on Geriatrics (through AYUSH) will be set up. Systems for quality certification of raw materials, accreditation of educational programs, health services and manufacturing units and products would be promoted in the Twelfth Plan.

Health Research

The strategy for health research in the Twelfth Plan would be the following:

Address national health priorities like maternal and child nutrition, health and survival; high fertility, low child sex ratio, health financing, prevention, early detection, treatment, rehabilitation of communicable and non communicable diseases, HIS covering universal vital registration, community based monitoring, disease surveillance and hospital based information systems, social determinants of health and inequity. A research coordination framework will be developed between ministry of Health and Family Welfare, AYUSH, AIDS control, Space, Science and Technology, Biotechnology, Agricultural Research; agencies like ICAR, DSIR, CSIR, NDMA, DRDO and the National Knowledge Network. New research centres will be developed with accountability and autonomy.

Convergence across sectors

The MoHFW would constitute a dedicated 'Health Impact Cell' to conduct analysis to determine the health impact of existing and new policies in sectors which have a bearing of the health of population

Convergent action on nutrition

The Ministry of health would build institutional arrangements with the Ministry of Women and Child development so that convergent delivery of services under ICDS becomes the norm.

States shall be encouraged through the sector-wide MoUs to observe Village Health and Nutrition Days in complete convergence mode and ensure that Anganwadi Centres become the hub for all health related services.

Child Nutrition and Restructuring ICDS

- The ICDS is a 35 year old program aimed at nutrition and pre school education. It can play a major role in promoting nutrition and therefore health outcomes, though as presently conceived, it has flaws. It focusses mainly on children in the age group of 3 to 6 years who actually attend *Anganwadis*, whereas the greatest need for nutritional support is in the age group of 0-3 years. The program needs to be radically restructured to focus on reaching pregnant and lactating mothers, and also the more vulnerable children in the 0-3 age group. Restructuring should promote decentralisation of administration, and laying stress not only on expansion, but also on quality.

- There is no national system of nutrition monitoring, mapping and surveillance in the country. District level disaggregated data are not available from existing surveys. DLHS remains inadequate in its coverage. There is a need to generate reliable District level disaggregated data so that government is able to monitor the progress made on under nutrition.The development of an e health database with health ID cards capturing complete digital histories will be planned.

Health in other sectors in the Planning Commission Document:

As well known health can not be achieved in isolation by efforts of only health department as it is determined by multiple factors under other sectors like ICDS, water supply and sanitation, education, agriculture, civil supply etc –

1) Education - School health check up and Mid-day Meal (MDM) and health and nutrition interventions for school age group. School health check up is feasible at the most once a year, but is not sufficient. Alternatively orientation of teachers about healthy schools and school children during pre service training as a part of their curriculum can bring the capacity and participation of teachers. This shall even reduce need for yearly health check up and bring it back to the earlier approach of 1st, 4th, 8th, 11th standard health check up. The same shall be more cost beneficial as well as cost effective.

2) Farm sector:

- Infections like Leptospirosis are related to agriculture and animal care sector (Gujarat).

Infection source and transmission is in this zone, outcome as human health is with health zone. Unless both the zones undertake research and plan evidence based interventions high human toll (mainly farm labourers, farmers, cattle care person) every year can not be prevented. Such convergent concern, approach and responsibility need to be reflected in this sector. The same has relevance with water management as well as change in irrigation and agricultural practices.

- Agriculture policy: Promotion policy for the crops like traditional cereals (like Ragi, Bajara, Nagli, Oat) which are traditional food for some regions, now scarce but their significant role in health and nutrition is lately understood and projected.

SWACHH BHARAT ABHIYAN /MISSION

Swachh Bharat Abhiyan and abbreviated as SBA or SBM for is a national campaign by the Government of India, covering 4,041 statutory cities and towns, to clean the streets, roads and infrastructure of the country. The campaign was officially launched on 2 October 2014. It is India's biggest ever cleanliness drive and 3 million government employees and school and college students of India participated in this event.

Background: With effect from 1 April 1999, the Government of India restructured the Comprehensive Rural Sanitation Programme and launched the Total Sanitation Campaign (TSC) which was later (on 1 April 2012) renamed Nirmal Bharat Abhiyan (NBA).

On 2 October 2014, Prime Minister of India Narendra Modi launched the Swachh Bharat Mission, which aims to eradicate open defecation by 2019, thus restructuring the Nirmal Bharat Abhiyan.

As of May 2015, 14 companies including Tata Consulting Services, Mahindra Group and Rotary International have pledged to construct 3,195 new toilets. As of the same month, 71 Public Sector Undertakings in India supported the construction of 86,781 new toilets.

Government and the World Bank signed a US$1.5 billion loan agreement on 30 March 2016 for the Swachh Bharat Mission to support India's universal sanitation initiative. The World Bank will also provide a parallel $25 million technical assistance to build the capacity of select states in implementing community-led behavioural change programmes targeting social norms to help ensure widespread usage of toilets by rural households.

COMMENTS

Strength

- Defining health strategy more broadly
- Increase Public Health expenditure to 2.5% of GDP
- Improve efficiency, effectiveness and accountability
- Creation of Public Health Cadre
- Promoting essential and generic drugs in Public Health system
- Programs to be assessed by outcomes rather than outlays
- Matrix to define the role and accountability of health, ICDS and Water and Sanitation Departments
- Real time data collection, community based validation and medical audits measure quality, cost effectiveness and promptness of health care.
- Health care delivery to be made consultative and inclusive through i) strengthening PRI's and Urban Local bodies ii) increase user participation through audits for all availability iii) Bi-annual evaluation of processes by civil societies.
- Break vicious cycle of multiple deprivations faced by women and girls, sex ratio increasing and Gender discrimination and domestic violence.
- Convergence of Health, ICDS and water and Sanitation under Zilla Panchayat system
- Policy focus on requirements of Old aged, Adolescents, differently-abled and mental health
- Focus on infectious diseases like Malaria, TB, HIV/AIDS
- Detection and treatment of Non communicable diseases like cardiovascular diseases, Cancers, Chronic respiratory diseases, tobacco-control,Hypertensions and diabetes
- Dedicated funding for family planning in high fertility states bundled with RCH services

Weakness and challenges

1. Every five yearly this huge task of formulating centrally plan has become a ritual.

2. Many a time whole exercise become useless if government changes or some calamity occurs. There is no scope of preparedness for such unforeseen events. 3. Health remain the neglected areas for so many years. Health expenditure as percentage of GDP has crossed 1% only in more than fifty years. Out of pocket of Household expenditure remain the highest which goes to private sector.
4. Emphasis on essential drug and generic drug use must be made mandatory with immediate effect that saves lot of corruption in the health system.
5. Construction of PHC, SC buildings with staff quarters giving priority to the remote areas in next 5 years should be priority. Similarly the Hospital buildings should be attractive and environment friendly.
6. Post of various group of workers remain vacant for a long time. Under such conditions health can not be expected to improve. All contractual people should be regularized with appropriate salary and promotional opportunities. One of the major stresses among health professionals is contract service which lead to attrition, corruption, health problems.
7. For last two decades government is trying their best to control adverse sex ratio in 0-6 years but failed. Gender discrimination is linked with all major indicators adopted in the 12th plan. No strong strategy has been suggested.
8. Once again promoting registered medical practitioners from other system of medicine and traditional birth attendants would invite criticism from an organized bodies such as Indian Medical Association. There is long time debate on the definition of quacks which will continue if such provisions are made in 12th Plan.
9. BSc course in Community health would be increasing further confusion when graduate and post graduate nursing and allied group of professionals are not allowed to give treatment or prescribe medicine to the patients. Nursing staff and pharmacists may be trained and promoted to become rural doctors. More schools and colleges of these course should be opened with quality training. Shortage of doctors from modern system of medicine has been calculated on the basis of WHO recommendation but how requirement of traditional system of medicine calculated. If both can treat the patients then available doctors exceed the requirement and further expansion should be curtailed.
10. Planning for health should be decentralized in proper manner. District plan based on each PHC and Subcenter should be part of state plans and not the idea generating group at the center who has no knowledge of ground. Health priority setting in support of Universal health coverage as envisaged in 12th Five year plan requires capacity and resources, as well as persuasive evidence to justify decisions. This involves two major steps: evidence generation and use of

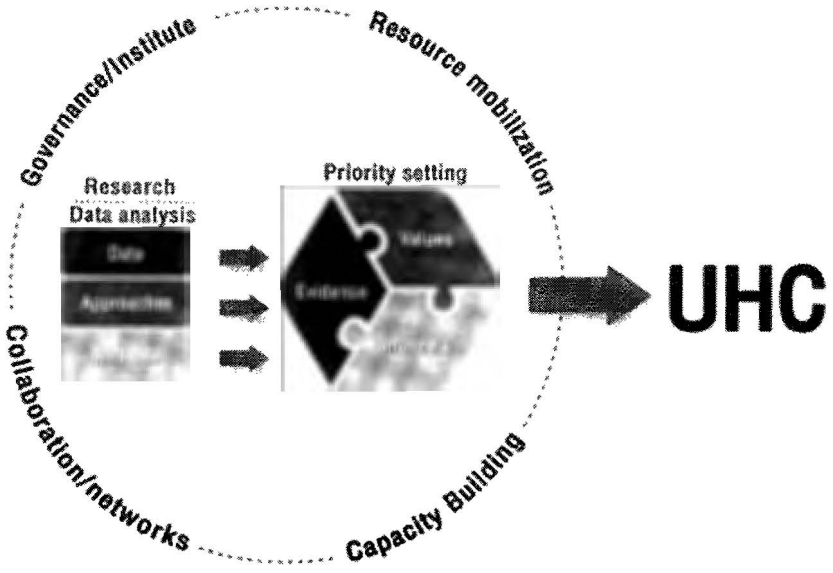


Figure 4.1: Framework for evidence informed priority setting (Source *BMJ* 2016)

evidence in resource allocation, programme management, and quality assurance. Priority setting in health systems is complicated by a wide range of political, economic, ethical, and sociocultural factors (Figure 4.1).

Reference

Patel V, et al. Assuring health coverage for all in India. Lancet 2015; 386: 2422-35

Planning Commission. Draft: Faster, Sustainable and more inclusive growth: An approach to the 12th Five Year Plan. Planning Commission Govt of India August 2011.

Planning Commission. Tenth Five Yea Plan (2002-2007) Volume II: Sectoral Policies and Programs (Health). Planning Commission Govt. of India, New Delhi.

Planning Commission. Twelveth Plan (2012-2017): Social Sector Vol III. Govt of India. New Delhi: Sage Publications India Pvt Ltd. 2013.

http://www.planningcommission.gov.in accessed on 2nd March 2009.

Yot Teerawattananon et al. Role of priority setting in implementing universal health coverage. BMJ 2016; 352 doi: http://dx.doi.org/10.1136/bmj.i244

CHAPTER 5

HEALTH CARE DELIVERY SYSTEM IN INDIA

The healthcare system in India consists of a public sector, a private sector and an informal network of providers of care operating within an unregulated environment, with no controls on what services can be provided by whom, in what manner, and at what cost, and no standardized protocols to measure the quality of care. There are disparities in access to health services particularly by vulnerable section of society, further worsened by the poor functioning of this public health system.

Health Care may be defined as multitude of services rendered to individual or communities by the agents of the health services or professional for the purpose of promoting, restoring and maintaining health. Health care along with prevention, promotion and rehabilitation care also includes medical care.

Health Services can be described as permanent countrywide system of established institutions, the multipurpose objective of which is to cope with the various health needs and demands of the population, and thereby provide health care to individuals and the community, including a broad spectrum of preventive and curative activities, and utilizing, to a large extent, multipurpose health workers. They rest traditionally upon a three-tier hierarchy of central, intermediate and peripheral levels.

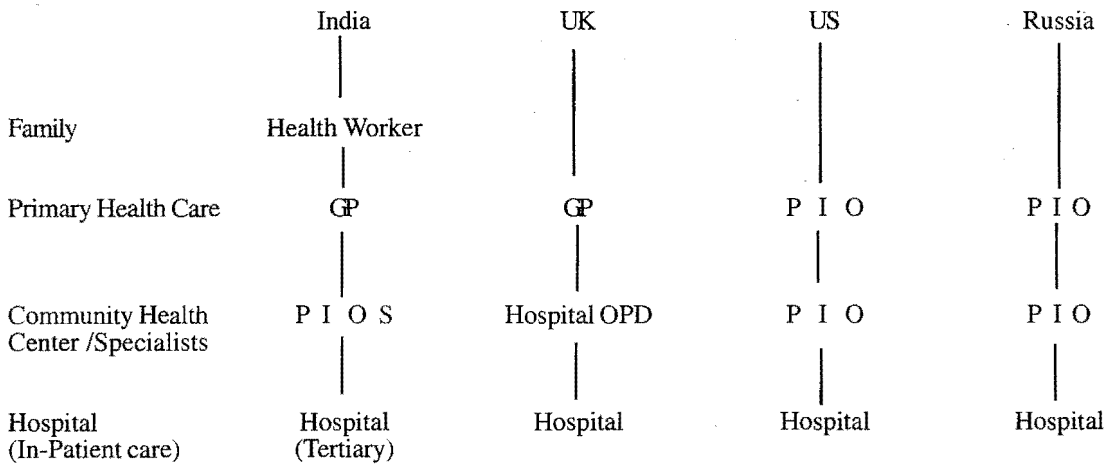
A health service can be understood as a system. Its components include: *concept* (e.g., health and diseases), *ideas* (e.g., equity), *objects* (e.g., hospitals, health centers), and *persons* (e.g., physician nurses). Together these form a system in which all the components interact to support or control one another.

Components of Health Service System

1. Structure of Health System: refers to those aspects of the design of health services that influence the way in which services are delivered. These include the numbers and types of personnel and staff; the way in which these personnel are organized to do their work; the nature and extent of the facility and equipment; the range of services offered; systems of management and amenities; accessibility; mode of financing; the way in which the eligible population is determined and enumerated; and the mechanisms of governance and administrative decision making. The most important component is health team. A ***health team*** is a group of persons having a common health goal, to the achievement of which each member of the team contributes in accordance with his or her competence and skill and in coordination with the functions of the others.

2. Process of Health Care delivery: refers to the aspects of the behavior or performance of the health

Figure 5.1: Different types of health care system



The Flow of Care Between the four different levels, GP-General Practitioner, I-Internal Medicine, P-Pediatrics, O-Obstetrics and Gynecology, S-Surgeon

care system or health facility and the nature of participation on the part of people it serves. These consist of two parts: behavior of the professionals and participation of the people who relate to the system or facility. Behavior of professionals includes the spectrum of clinical care involving problem (or needs) recognition, the diagnostic process, the recommendation of treatment or management; and appropriate follow up. Participation of people who relate to the system includes utilization, understanding of recommendations, satisfaction with services rendered, and participation in decisions concerning strategies for management.

3. Outcomes of Health Care: are those aspects of health that result from the interventions provided by the health system, the facilities and personnel that recommend them and the actions of those who are the targets of the interventions.

4. Flow of patients in health care system: differs from country to country as shown in figure 5.1 (Kishore 2013). Because of this multistage system of health services a poor and illiterate patient finds difficult to understand how he/she should approach. Multi-stage system (Three tier) in India also indicate the less specialized system where very few specialists are available and majority of health care is delivered by community health workers. In advanced countries patients are directly approaching to a general physician or specialist. However, Indian system is more cost effective if health workers are skilled and effectively supervised for their work. This could be one of the reasons for higher cost of health care delivery in developed countries.

Health care services in Selected Countries

United States: In the United States, ownership of the health care system is mainly in private hands, though federal, state, county, and city governments also own certain facilities. The non-profit hospitals share of total hospital capacity has remained relatively stable (about 70%) for decades. There are also privately owned for-profit hospitals as well as government hospitals in some locations, mainly owned by county and city governments.

There is no nationwide system of government-owned medical facilities open to the general public but there are local government-owned medical facilities open to the general public. The federal Department of Defense operates field hospitals as well as permanent hospitals (the Military Health System), to provide military-funded care to active military personnel.

The federal Veterans Health Administration operates Veteran Administration (VA) Hospitals open only to veterans, though veterans who seek medical care for conditions they did not receive while serving in the military are charged for services. The Indian Health

Services (IHS) operates facilities open only to Native Americans from recognized tribes. These facilities, plus tribal facilities and privately contracted services funded by IHS to increase system capacity and capabilities, provide medical care to tribals beyond what can be paid for by any private insurance or other government programs. Hospitals provide some outpatient care in their emergency rooms and specialty clinics, but primarily exist to provide inpatient care. Hospital emergency departments and urgent care and centers are sources of sporadic problem-focused care. "Surgicenters" are examples of specialty clinics. Hospice services for the terminally ill who are expected to live six months or less are most commonly subsidized by charities and government. Prenatal, family planning, and "dysplasia" clinics are government-funded obstetric and gynecologic specialty clinics respectively, and are usually staffed by nurse practitioners.

Russia: Pre-1990s Soviet Russia had a totally socialist model of health care with a centralized, integrated, and hierarchically organized with the government providing free health care to all citizens. All health personnel were state employees. Control of communicable diseases had priority over noncommunicable ones. There was over provision of hospital beds, which contributed over time to an imbalance in the overall structure of the health care system. On the whole, the Soviet system tended to neglect primary care, and placed too much emphasis on specialist and hospital care.

Despite weaknesses, the integrated model achieved considerable success in dealing with infectious diseases such as tuberculosis, typhoid fever and typhus. The effectiveness of the model declined with underinvestment. Despite a doubling in the number of hospital beds and doctors per capita between 1950 and 1980, the quality of care began to decline by the early 1980s and medical care and health outcomes were below western standards. The lack of money that had been going into health was patently obvious. A 1989 survey found that 20% of Russian hospitals did not have piped hot water and 3% did not even have piped cold water. 17% lacked adequate sanitation facilities. Every seventh hospital and polyclinic needed basic reconstruction. Five years after the reforms per capital spending on health care was still a meager US$158 per year (about 8 times less than the average European social models in Spain, the UK and Finland, and 26 times that of the U.S. which spent US$4,187 at that time). There are many initiatives that have been undertaken by the Russian government recently and expecting better outcome in coming future.

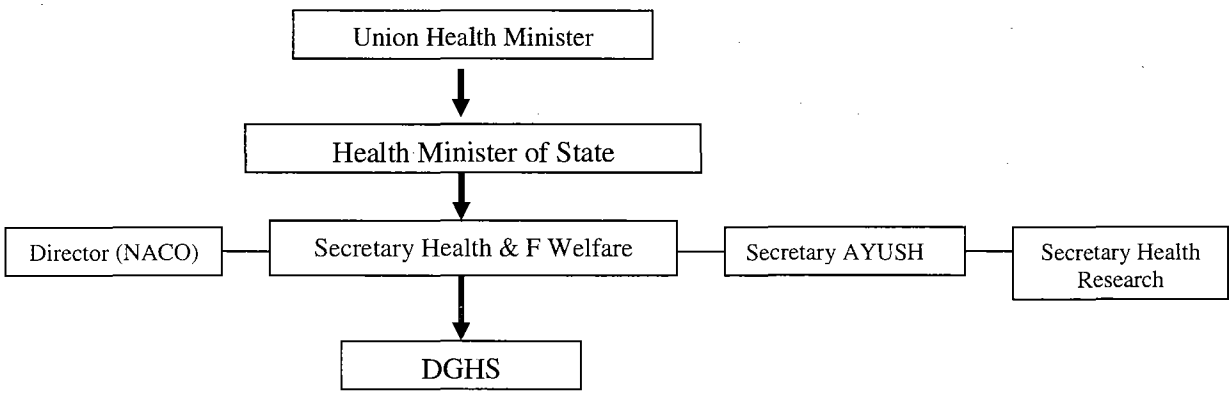
UK: The National Health Service (NHS) is free at the point of use for the patient though there are charges associated with eye tests, dental care, prescriptions, and many aspects of personal care. The NHS provides the majority of healthcare in England, including primary care, in-patient care, long term health care, ophthalmology and dentistry. The National Health Service Act 1946 came into effect on 5 July 1948. Private health care has continued parallel to the NHS, paid for largely by private insurance, but it is used by less than 8% of the population, and generally as a top-up to NHS services. Recently there have been some examples where unused private sector capacity has been used to increase NHS capacity and in some cases the NHS has commissioned the private sector to establish and run new facilities on a sub contracted basis. Some new capital programs have been financed through the private finance initiative. The involvement of the private sector remains relatively small yet, according to one survey by the BMA, a large proportion of the public oppose such involvement.

Evolution of the health system in India

The evolution of India's health system can be categorized into three distinct phases:

- Phase I (1947-83)- when the health policy was based on two principles: (1) that none should be denied care for want of ability to pay, and (2) that it was the state's responsibility to provide health care to the people.
- Phase II (1983-2000)-when the first National Health Policy of 1983 articulated the need to encourage private initiative in health care service delivery, while at the same time expanding access to publicly funded comprehensive primary health care.
- Phase III (post 2000)-which is witnessing a further shift that has the potential to profoundly affect the health sector in three important ways: (1) the desire to utilize private sector resources for addressing public health goals; (2) liberalization of the

Figure 5.2: Organizational structure of Ministry of health



insurance sector to provide new avenues for health financing; and (3) redefining the role of the state from being only a provider to a financier of health services as well.

HEALTH CARE PROVIDERS IN INDIA

Multiple agencies are working in India to provide health care including both government, semi-government and private. Majority of people are going to the private sector, however, government (state and central) infrastructure is very big (Table 5.1).

Public Health Care System in India

National Level

The organization at the national level consists of the Union Ministry of Health and Family Welfare. The Ministry has four departments namely-Health and Family Welfare, Health Research and AYUSH. These departments are headed by one or two secretaries who belong to the cadre of Indian Administrative Service (IAS). Department of health is supported by a technical wing which is headed by Director General of Health Services who is recruited from Central Health Service (CHS) (Figure 5.2).

Table 5.1: Healthcare Providers in India

Departments under State Government	Departments under Central Government	Non-Government
• Public health department (primary health centres, dispensaries, hospitals) • Medical educationdepartment (medical collegehospitals) • Municipal administration department (health care facilities under localgovernments) • Non-allopathic systems of medicine (Ayurveda, Homeopathy, etc.)	1 Under Ministry of Health and FamilyWelfare (MoHFW) • Central Health Services Medical Colleges • Corporate industries • Central Government Health Services CGHS 2. Ministry of AYUSH 3 Ministries besides MoHFW • Railway hospitals (Railway Ministry) • Employees' State Insurance (Labour Ministry) • Coal department (Ministry of Mines) • Port hospitals (Ministry of Shipping) • Steel plants (Ministry of Steel) • Armed forces hospitals (Ministry of Defence) • Refineries (Ministry of Petroleum & Natural gas) • Thermal plants (Ministry of Power)	• Private hospitals • Private practitioners • NGO health facilities • Non-allopathic practitioners • Traditional healers, etc.

Central Health Service: It provides medical professional manpower for the Directorate General of Health Services, Central Government Health Scheme, Government of NCT Delhi, Department of Labor, Department of Posts, and Assam Rifles. Central Health Service now consists of the following four sub-cadres as given:

I. General Duty Medical Office sub-cadre
II. Teaching Specialists sub-cadre
III. Non- Teaching specialists sub
IV. Public Health Specialists sub-cadre
There is the Higher Administrative Grade (HAG), which is common to all the four sub cadres.

State Level

State Department of Health and Family Welfare is headed by a Minister and with a Secretariat. This secretariat is headed by a secretary or commissioner (Health and Family Welfare). The state directorate is a technical wing headed by Director of Health Services. However, the organizational structure of the state Directorate of Health Services is not uniform and in some states Additional Director or Joint or Deputy Director may head the Directorate. Some states have created the posts of Director (Ayurveda) and Director (Homeopathy).

District Level

The district level structure of health services is a middle level management organization and it is a link between the state as well as regional structure on one side and the peripheral level structure as CHC, PHC as well as sub-center on the other side. It receives information from the state level and transmits the same to the periphery by suitable modifications to meet the local needs. The district officer with overall control is designated as the Chief Medical and Health Officer (CM & HO or CMO) or as the District Medical and Health Officer (DM &HO or DMO or CDMO). They are responsible for implementation of various policies and programs and report to their state.

URBAN AREAS

Central Government Health Scheme (CGHS)

The central government health scheme was started in 1954 with the objective of providing comprehensive medical care facilities to the central government employees and their family members. Beside them, this scheme also provides services to members and ex-members of Parliament, judges of Supreme Court and High Court, Freedom fighters, Central Government pensioners, Employees of semiautonomous bodies/ semi-government organizations, accredited journalists, and ex-Governors and ex-Vice Presidents of India. The scheme which was initially started in Delhi was extended to Ahmedabad, Allahbad, Bangalore, Bhopal, Bhubaneswar, Chandigarh, Chennai, Guwahati, Hyderabad, Jabalpur, Jaipur, Kanpur, Kolkata, Lucknow, Meerut, Mumbai, Nagpur, Patna, Pune, Ranchi, Shillong, Thiruvananthapuram, and Dehradun.

There are allopathic dispensaries for cardholders of CGHS. There are dispensaries of Indian System of Medicine and Homeopathy, polyclinics, maternity hospital and maternity centers, laboratories, dental units, and allopathic first aid posts.

Facilities provided by CGHS are emergency services, free supply of drugs, lab and radiological investigations, domiciliary visits, specialists consultations at hospital level and family welfare center level.

Government Hospitals: WHO defined hospital as an integral part of a social and medical organization and the functions of which is to provide for the population complete health care - both curative and preventive and whose out patient services out to the family and its home environment; the hospital is also center for training of health workers and for biosocial research. In each states there are hospitals run by state governments.

Urban Health Services

The Government of India has identified "Urban Health" as one of the thrust area in the Tenth five Year plan, National population policy, 2000, National Health Policy 2002, and the 2nd phase of the Reproductive Child Health Program.

Under the on going RCH program, Urban Health has been included and sought to be effectively addressed under one component thereof viz. "Vulnerable Communities RCH". Vulnerable Communities have been defined to include those groups, which are underserved due to problems of geographical access (even in better off states) and those who suffer social and economic disadvantage such as the scheduled

Table 5.2: Health Manpower in Rural Areas State wise distribution

Health workers	No.
ASHAs	849331
ASHAs with Drug Kits	*690221*
Subcenters	147069
Subcenter with ANMs	148366
Subcenters without ANMs	*6127*
Subcenter with second ANMs	59068
Primary Health Center (PHC)	24049
PHC without doctors	*753*
Community Health Center (CHC)	4833
Specialists Required	18140
Specialists in Position	*6781*
District Hospital FRU	574
Sub District Hospital FRU	826
Staff Nurses required	18733
Staff Nurses in Position	6414
State Program Management Unit	35
District Program Management Unit	637
Managers at DMU	583
Accountants	575
MIS specialists	565

(Source: NRHM MOHFW Govt. of India 2011)

castes/ scheduled tribes and the urban poor. The overall goal of the vulnerable communities RCH component is to improve the health states of the vulnerable population by ensuring accessibility and available of quality primary health care and family welfare services to them. The overall objective in this regard is to: (i) Improve accessibility, availability and acceptability of health services, including RCH services by strengthening infrastructure including training and skill development of service providers, improving supply of equipment, drugs etc. in an integrated and participatory manner and (ii) to bring them at par with rest of the population and thus improving the aggregate indicators achieving the expected results set under RCH program.

The government of India constitutes a Task Force to advise the National Rural Health Mission (NRHM) on 'strategies for urban health care".

Urban Family Welfare Centers

These centers were launched during the first Five Year Plan. At present, 1083 centers are functioning and providing outreach services, primary health care, MCH services and distribution of contraceptives.

Urban Health Posts

URBAN REVAMPING SCHEME

This Scheme was introduced following the recommendation of the Krishnan Committee in 1983. The main focus was to provide services through setting up of Health Posts mainly in slum areas. The services provided are mainly outreach of RCH services, preventive services, first aid and referral services including distribution of contraceptives. Four types of health posts were set up depending on the allotted population in the catchment's area of the centre covered. For Type A, the criterion is less than 5000 population. For Type B it varies between 5-10 thousands whereas for Type C it is 10-25 thousands. For Type D the limit is 25-50 thousands population. Only Type D Health Posts have a post of Medical officer. These also provide outreach of RCH services, first aid, referral services and distribution of contraceptives.

RURAL AREAS

In rural areas, primary health care services are provided through a network of 148366 sub-centers, 24049 Primary Health Center and 4833 community Health. There is augmentation of staff at all levels but gaps are present as far as specialists and staff nurse is concerend (Table 5.2).

Community Health Center

For a successful primary health care program, effective referral support is to be provided. For this purpose one community health center (CHC) has been established for every 80,000 to 120,000 population, and this center provides the basic speciality services in general medicine, pediatrics, surgery and obstetrics and gynecology. Under Indian Public Health Standards, there is provision of one anesthetist and one eye specialist supported by 24 paramedical and other staff with inclusion of two nurse midwives in present system of 7 nurse midwives. The CHC are established by upgrading the subdistrict /taluka hospitals or some of the block level primary health centers (PHCs), or by creating a new center wherever absolutely needed.

Primary Health Center

At present there is one Primary Health Center (PHC) covering about 30,000 (20,000 in hilly, desert and

difficult terrains) or more population. Many rural dispensaries have been upgraded to create these PHCs. Each PHC has staff of 15-17 including one medical officer, one nurse midwife, two staff nurse on contract, two health assistants (Male & Female), and one pharmacist, one extension educator, one laboratory technician, two health workers (one male & one female each), one Upper Divisional Clerk (UDC) and one Lower Divisional Clerk (LDC), four class IV and one driver. For strengthening preventive and promotive aspects of health care there should be a post of community health officer. Primary function is preventive, promotive and curative health services delivery to the community. Medical officer is team leader of all staff posted under one PHC jurisdiction, i.e., 5-6 sub-centers, 25-30 village health guides and dais, and 25-30 anganwadis. At the PHC there should be at least 4-6 beds for patients.

One female health assistant has to supervise the work of six sub-centers in the rural areas. She provides technical guidance and supervision to the ANMs. Similarly one male health assistant supervises the work of 5-6 health workers (male).

A majority of PHCs do not have the full complement staff. In addition, shortages and misuse of transport funds preclude the ability of the MO to travel to the field and back up the ANM with the requisite service delivery and supervisory support. The women physicians are few in number at PHCs, which causes difficulty in delivery of RCH services. That could be one of the reasons of why less than 25% of women utilized RCH services at PHC. MOs prefer more to remain at their PHC of posting and hardly travel for supervisory visits to the villages.

Sub-Center

The most peripheral health institutional facility is the sub-center, which is run by one female (Auxiliary Nurse Midwife) and one male multipurpose worker. At present, in most places there is one sub-center for about 5000 populations (3000 in hilly and desert areas and in difficult terrain). Subcenters are assigned tasks related to maternal and child health, family welfare, nutrition, immunization, diarrhea control and control of communicable diseases programs and provided with basic drugs for minor ailments needed for taking care for essential health need for women and children. Government of India bears the salary of ANM and LHV besides rent liability and contingency whereas, the salary of the male health workers is borne by the state governments.

NRHM seeks to strengthen sub-centers by provision of untied funds of Rs. 10,000 per year which would be operated by the ANM and the *Sarpunch*, supply of allopathic and indigenous medicines and provision of additional workers (Male MPW or additional ANM).

Auxiliary Nurse Midwife /Multipurpose Worker Female

The ANM is a worker who is most directly in touch with the community. The ANM is expected to implement a range of programs and her duties range from conducting the community needs assessment to conducting delivery at the subcenter or at home. Community or field level outreach is the responsibility of the ANM. She also provides preventive, promotive, and selected curative services for safe motherhood, child health, immunization and family planning. Her duties include education, motivation, counseling and service provision.

ANMs receive an initial 18-month training then subsequently supplemented by in-service training, often focussed on additional duties. Over the years, the training program of ANMs has moved from being knowledge-based to a hands-on, skill-building approach.

In an observational study of ANMs conducted across the country, where services were graded-excellent (>75% of subtasks performed well), satisfactory (50% -75% of tasks well done) and poor (50% of tasks well done)-none of the ANMs performed excellent in any of the major services (ANC, delivery, prenatal care, immunization and contraception) (Rangarao 2003). The stress on achieving sterilizing targets left them with little time to attend to their other duties. Outreach services are uneven and often only to houses close to the road, or in the vicinity of subcenter or anganwadi center. The ANM has to maintain thirteen registers and submit seven reports to the PHC. Supervision is focused on the reports and little other support is provided. The Lady health Visitor (LHV)/health assistant female is expected to support the ANM. However, her own lack of professional competence and the high priority accorded to records and

achievement of family planning targets have rendered her more on an administrative supervisor than a clinically competent paramedical provider who can support the ANM in her day-to-day clinical duties.

Overburdening of the ANM has been a consistent finding in several studies. Lack of physical infrastructure, equipment and basic amenities at the subcenter are major reasons for the low motivation and absenteeism among ANMs. The majority of subcenters do not have the facility for storing vaccines. Unless the ANM has a vehicle or suitable trasnport facility, she spends the better part of the day in going to the PHC, obtaining a supply of vaccines and then travelling to the habitation/ village. Even assuming that the distance from the subcenter to the PHC is about 5 kilometers, lack of adequate transport and weight of the supplies (estimated to be about 15 kg for the essential equipment required to conduct ANC and immunization) make the task difficult. It is clear that there is no time to conduct village-level education sessions or house to house visits for newborn and postnatal care.

ANM shoulders more than a fair share of her burden since the workload has not decreased. Now DOTS and Leprosy MDT and many other work also imposed on them because of integration of various health programs under NRHM.

Multi-Purpose Worker (Male)

As per the norms, each sub-center is required to be manned by a trained female and a trained male health worker. This scheme was started in 1978 in which uni-purpose workers were trained to do multiple works. The candidates who had passed 10th standard were recruited and trained for one year. This scheme was 100% centrally sponsored.

Village level

One village health guide and one trained dai or traditional birth attendant (TBA), selected from the community are voluntary workers. These two village level functionaries are not regular government employees. The Village Health Guides initially worked under the Community Health Workers Scheme launched in 1977 which was renamed as Village Health Guide (VHG) Scheme in 1981. It is 100% centrally sponsored scheme under Family Welfare Program. He/she provides health education and creates awareness on MCH and family welfare services. He/she also provide track of communicable diseases and treat minor ailments and provide first aid to the patients. Dai and VHG receive technical support and continuing education from the multipurpose health workers posted at the sub-center. At present at the village level Accredited Social Health Activist (ASHA) has been posted under the National Health Mission who acts as the link between people and subcenter staff. From the center village health guide and trained dai schemes are abolished. Anganwadi Worker is not the part of health department and comes under Ministry of Women and Child Development however, she also play a significant role in healthcare delivery.

Health Human Resource in India

There is a wide range of health workers in India's health workforce which includes formal and informal medical practitioners. In 2013 India has 918303 allopathic doctors and 686319 AYUSH (Ayurveda, Yoga and naturopathy, Unani, Siddha and Homoeopathy) practitioners. This gives the average of 1331.43 population served by allopathic doctor and 1782.8 by AYUSh doctor. If we combined then it is 762.53 population served by either of allopathic or AYUSH doctor. There are 643301 pharmacists, and 231827 dentists. There are 726557 ANM, 1562186 Registered Nurses and 55498 LHV. More than 70% allopathic doctors are working in private sector.

Recent data from Rural Health Statistics Report (2015) indicates that 8.1% of the PHCs were without a doctor, 38.1% were without a lab technician and 21.9% were without a pharmacist. The position of CHC with respect to human resources is even poorer as out of the sanctioned posts, 74.6% of surgeons, 65.4% of obstetricians & gynaecologists, 68.1% of physicians and 62.8% of pediatricians were vacant. Overall 67.6% of the sanctioned posts of specialists at CHCs were vacant (Health Statistics of India 2015). Workforce Indicators and Staffing Need (WISN) approach that calculates the expected demand a package of services should generate, found significant gap in supply of health workers across all categories in Ganjam district of Orissa and estimated a need of additional 43 physicians, 15 nurses and 80 nurse midwives (Hagopian A 2012).

There is an uneven distribution of health workers across the country which ranges from 23.2 per 10,000 population in Chandigarh to 2.5 per 10,000 population in Meghalaya. The states of Goa and Kerala has very high number of allopathic doctors (41.6 per 10,000 and 38.4 per 10,000 respectively) as compared to other states like Orissa (19.7 per 10,000) and Chhattisgarh (15.8 per 10,000) and other north central states. The inequity in distribution is also observed in terms of male female ratio of health workers. Almost two third of all health workers are men. The number of female doctors across different states of country ranges from 7.5 in Chandigarh to 0.26 in Bihar per 10,000 population. There are 6.5 female allopathic doctors per 10,000 population in urban areas as compared to 0.5 per 10,000 in rural areas (Rao et al 2009).

Gross imbalance in health workers between urban and rural areas is visible by the fact that there are 42 health workers in urban areas as compared to 11.8 in rural areas per 10,000 population. This imbalance is even more (three times) when we consider allopathic doctors (13.3 in urban areas versus 3.9 in rural areas), nurses and midwifes (15.9 in urban areas versus 4.1 in rural areas) and AYUSH practitioners (3.6 in urban areas versus 1.0 in rural areas) per 10,000 population. Further, majority (70%) of the existing health human resource in private sector (Rao 2006). This imbalanced distribution of health workers in terms of male or female, urban or rural, public or private impedes the universal access to health care goals (Table 5.2).

Reasons for shortage in rural and underserved areas of India

There are several reasons for this short fall:

1. Absence of formal mechanism to undertake manpower planning and forecasting on regular basis. Planning exercise focused mostly on creation of new infrastructure rather than recruiting specialized manpower.
2. Nonexistence of specialized human resource department, poor recruitment, transfer and promotion system.
3. Poor Socio-demographic and economic factors of region
4. Rapid growth of the private medical colleges promoting profit oriented ideology of healthcare
5. Poor job availability of trained human resource forcing them to migrate in other developed nations
6. Poor governance and insufficient budget allocation to health care. The budget allocation for training and skill enhancement receive even low priority.
7. Inability of employers to provide safe, satisfying and rewarding work conditions is another significant factor for health care worker attrition from rural India.

Strategies adopted for human resource management in rural and underserved areas:

1. Legislations

Specific legislations in many states have helped for posting in rural areas. Experiences from Rotational posting in difficult areas after which they can be posted in the area of their choice in Tamil Nadu and Karnataka states has shown encouraging results. Compulsory rural bonds for those obtaining medical education from government colleges have been used in many states including Kerala, Tamil Nadu, Meghalaya and Nagaland to fill vacancies in rural areas. A number of other states have made rural service mandatory criteria for admission into post-graduate programs. Postgraduate training in clinical subjects in rural setting would be useful if course curriculum specify such postings. But it should not be limited to few states because other states where such mandatory posting is not present students try to shift to such states.

2. Financial Incentives:

Review conducted on financial incentives for service in underserved areas found that such incentives do not necessarily increase workforce in the required areas. Another review concluded that strategy to provide financial incentives helped in short-term recruitment but had less success with long-term retention. Financial-incentive programs need to be bundled with other interventions like regulation, educational, personal and professional support. In India, 'difficult area incentive' has been introduced in most states for doctors, nurses and midwives working in rural and remote areas.

3. Rural orientation in medical education

Physician characteristics, training environments and rural training curriculum are important factors in attracting physicians to rural practice locations. Undergraduate (UG) medical education in rural setting

is positive influencer for placement in rural area. Students in rural rotations displayed better performance, greater clinical exposure, more satisfaction and significant improvement in clinical skills compared to urban counterparts.

4. Multitasking and Par-skilling

Multitasking involves enhancing job responsibilities of one category of health worker in case of inability to deploy more. Assam and Chhattisgarh created a cadre of rural medical practitioner with three years' training for working in primary health care in rural areas. Extreme shortage of specialists in the public health care delivery system prompted training of medical officers in emergency obstetric care and anesthesia.

5. Other Strategies

In difficult areas allowing inter-professional practice education, group housing for health workers living in remote areas, effective management of workforce issues legislations for post graduate entrance examination, and simplification of recruitment process are other strategies.

Medical Education and training of health human resource

In one of the studies of WHO-SEARO it was found that there is a wide gap in perception of faculty about priority of curriculum content and morbidity pattern of patients coming to OPD and topics covered in examination. In another study, about two thirds of the fresh graduates felt that their skills in medicine needed improvement for them to operate independently; about 30% of the graduates expressed lack of confidence in providing services independently, and one third of these were not even confident of providing the services under supervision.

A large number of fresh graduates have poor knowledge and skills of simple procedures and conditions like immunization, nutritional advice, IV fluids injections, oral pills, insertion of IUDs, etc (NIHFW 1992, Kishore 2016). Medical graduates are more urban oriented and heavily dependent on methods used in tertiary care. Their career aspirations are also different from objectives set by the government for human resource development. They have failed to position themselves comfortably in the social ambience of the country, and also failed to recognize health services as a fundamental requirement of the community. Therefore community medicine is not their choice of post graduation or life long career (Kishore 2016).

Success of Public Health Services (Tamil Nadu Model)

Following strengths of the model have been observed (Das Gupta 2010) that could be the reasons of success of public health services in Tamil Nadu:

(i) Policy and Planning: A Separate Directorate of Public Health:

The health department has three key directorates which are organizationally on an equal footing under the health secretary: the Directorates of Public Health, of Medical Services, and of Medical Education. Each of these directorates has its own dedicated budget and workforce. Each service stream has its own career paths and incentives, and offers the possibility of rising to the same level within the health department.

The Directorate of Public Health is staffed by the professional trained public health managers, who are promoted to the directorate after long experience of managing public health services in both rural and urban areas. Other technical staff in the directorate, such as entomologists and statisticians, is also experienced in the districts. This means that the Directorate of Public Health is run by highly experienced staff. The medical cadre staff begins their career in a primary health centre under the public health managers. They are more aware of public health needs and approaches. This system makes possible the proactive planning and effective disaster management described below.

(ii) A dedicated and substantial funding: The directorate has its own funding and sufficient to be proactive for public health work. It can thus ensure that the public health workforce includes specialists, managers, grassroot workers, and other technical staff suggested by the central government for environmental sanitation measures such as clearing vector-breeding places. For example, Tamil Nadu has more than 100 entomologists helping the efforts of controlling vector-borne diseases. Secondly, it provides the budget for ensuring service delivery. This includes maintaining needed technical units, such as the plague surveillance unit or IDSP unit. It is well understood that even if there is excellent public health expertise in top positions, it can be difficult in the absence of a separate staff for surveillance work.

(iii) Legislative and Regulatory Bodies for Public Health Services: Public health service provision is greatly facilitated by the Tamil Nadu Public Health Act that defines public health nuisance in a broader sense that that every environmental and other risk factors can be handled for example, nuisances are premises or animals kept in unhealthy conditions, stagnant water or ill-maintained drains, and accumulation of refuse. Health officers are empowered to detect nuisances following a complaint from a citizen or by using their powers of entry and inspection, and to contain nuisances, including by direct action if needed. Unlike the health provisions in the Municipalities Act and Panchayati Raj Act, its provisions are much more detailed and comprehensive, and apply uniformly across the state instead of just in specific areas which is covered by municipalities.

Table 5.3: Health Spending (by Directorate), Tamil Nadu

Health Department	2008-09 % Share
Directorate of Public Health	38.8
Directorate of Medical Services	23.1
Directorate of Medical Education	38.1
Total	100.0

1 The Directorate of Public Health's budget includes the entire public health workforce down to subcentres, and all the single issue programs except TB and leprosy.
2 The Directorate of Medical Education's budget includes teaching hospitals and attached institutions.
3 Excludes cash subsidies to pregnant/lactating mothers.

(iv) Prioritizing health: A Political Perspective

Two aspects of the government approach remained consistent since the early 1980's. i.e., Health policies and government spending on health to improve primary care services, especially in rural, poor and disadvantaged communities and secondly political leaders have been committed to implementing innovative interventions, efficiently and effectively. Populist leadership ie., representing or connected with the ideas and opinion of ordinary people was found to be common among all the political leaders who were in power since the early 1980's. The success of backward caste groups in securing political power have contributed extensively to the public action at the grassroots for public services.

(v) Tamil Nadu Medical Service Corporation (TNMSC)

A major initiative was taken up by the State Government to set up a Government Company in 1995, with the primary objective of ensuring ready availability of all essential drugs and medicines in all the government health facilities, by adopting a streamlined procedure for their procurement, storage and distribution. This Corporation had finalized the list of essential drugs based on the WHO's Model List of essential drugs. Now, TNMSC has 271 items of drugs accounting for around 90 percent of the budget outlay for the purpose. Leaving other drugs of small quantities to be purchased locally by the Institutions from out of the remaining 10 percent of the budget. This had improved availability of drugs in nearly 2000 Government Medical Institutions.

(vi) Workforce-training, Incentives, and Responsibilities of Public Health Managers: The public health managerial cadre received orientation training towards an administrative and management role rather than a clinical role, and towards examining health issues from a population-wide perspective instead of focusing on the needs of a specific patient. They have faster promotion avenue as well as enjoying considerable administrative responsibility and authority. Medical graduates who choose to enter this service are given three months pre-placement training in public health, and must within four years obtain a postgraduate diploma or degree in public health. Their first posting as Municipal Health Officer (MHO) puts them in charge of public health services of a city or large town. From there they are promoted to deputy director of health services (DDHS), in charge of a whole district. Thereafter they are promoted to the Directorate. They can also opt to teach for a while, imparting their experience to future public health managers.

The DDHS is supported at the district level by an entomologist (district malaria officer), a statistician (assistant director, State Bureau of Health Intelligence), a district maternal and child health officer, and a technical assistant promoted from the health inspector cadre. Below this is the block primary health centre, headed by the block medical officer and supported by clinical as well as public health staff. The latter include a community health nurse and a block health supervisor,

who respectively supervise the teams of female maternal and child health (MCH) workers and male health inspectors down to the sub-centers.

These supervisors are promoted from amongst the cadre of workers they supervise. The DDHS manages all the workers at the district and block levels downwards who work on rural health, down to sub-centers. Primary health care is provided by the block medical officer (BMO) and the medical officer of the PHC (MO-PHC), but they are also oriented towards population-wide concerns. For example, when cases of communicable diseases present themselves in the health centers, they are expected to have their health inspectors follow up to investigate contacts and sources of infection, to prevent further spread of the disease. They supervise all the block public health workers, but belong to the medical cadre. Before being posted as BMO/PHC-MO, they are given 15 days' intensive training for their public health supervisory duties, on public health acts and food safety, environmental health issues, national health programs, prevention and control of epidemic outbreaks, administrative and financial powers, and health education of the community.

The DDHS is responsible for the health of the district as a whole, and not just for the rural areas. The MHOs report to the DDHS on public health matters in the municipalities of the district. The DDHS has the residual responsibility to address public health threats in all urban areas in the district. He/she is responsible for organizing an annual cycle of work. Every February they prepare the district's Epidemic Contingency Plan, including plans for responding to natural disasters such as floods and cyclones. In May, they carry out preparatory measures for the summer, including antidiarrheal measures such as ensuring adequate supplies of disinfectants and water purifying agents, and distributing information to communities about how to avert diarrheal outbreaks. In June, they undertake preventive measures against mosquito-borne diseases, including activities such as drain cleaning to prevent mosquito breeding, spraying as needed, providing technical support to local bodies in their vector control activities, and creating community awareness of the need to remove potential vector-breeding sources. Monsoon preparedness work is carried out for both annual monsoon seasons, including preparation for prevention and control of diarrheal disease and floods. Although this planning is made in every state but its implementation is a major issue.

(vi) Planning to Avert Outbreaks: In a flood, the first task is to purify the water sources. This is done by the local body, but the Health Department staff monitors the water quality and chlorination level. If there are internally displaced people, then arrangements have to be made in their camps for toilets and for food sanitation in the kitchens where their food is prepared. Fly control is undertaken. If water begins to stagnate, mosquito control is carried out. The bodies of dead animals and humans are disposed of by the local bodies in collaboration with the Revenue Department (the authorized department for declaring the number dead and digging mass graves) and under the supervision of the District Collector. If the disposal of bodies is not done promptly, the Health Department has to notify the local bodies and higher authorities of this public health nuisance, and mobilize their support in removing the nuisance. This is normally done by the Health Inspectors, along with vector control measures.

The WHO noted that despite the scale of the tsunami, the state public health authorities' response was rapid and highly organized, and the state government was able to carry out the relief measures largely on its own: The presence of a well-trained public health cadre enabled massive mobilization and deployment of people and material in a smooth manner....this resulted in one of the truly remarkable achievements of the relief effort – the complete avoidance of any kind of epidemic (WHO 2006).

(vii) Eradicating Diseases and Preventing Their Resurgence: Tamil Nadu seeks to prevent potential resurgence of diseases by proper surveillance of potential diseases, e.g., state plague surveillance unit that help in control the plague outbreak in northern India.

(viii) Management of Endemic Diseases: The strength of Tamil Nadu's public health management is illustrated also by their routine work to contain endemic diseases, such as malaria. Malaria control requires multi-pronged efforts, including (1) controlling vector breeding through environmental management and the use of chemical and biological larvicides, (2) containment of adult mosquitoes through insecticide

spraying and fogging, (3) early detection and treatment, (4) personal protection measures, and (5) raising community awareness and engagement in all these measures.

(ix) Intersectoral Coordination and Support to Local Bodies in Their Environmental Sanitation Work: With its professional public health management, Tamil Nadu is well-placed for intersectoral coordination and support to local bodies. Through their work, the citizenry, local bodies, and other parts of the state administration also become more sensitized to public health issues, and to the need for proactive efforts to address them. At the district level, the district collectors become sensitized to the need for anticipatory public health planning. In case of a suspected outbreak, the district collector calls a meeting with representatives from the health department and other departments as needed. They develop a coordinated response plan and assign responsibilities to each department – for which they will be held accountable.

The district collector is also mandated to hold meetings every three months of the public health intersectoral coordination committee (Epidemic Coordination Committee) to review the measures taken to anticipate disease threats and respond to them.

Other departments are called to these meetings as needed. The DDHS must inform the collector about issues such as mosquito nuisance, contamination of water sources, breakages of pipelines etc, which are recorded in the minutes for follow-up action and the departments held accountable for these actions. At the block level, the block development officer and the block medical officer handle interdepartmental coordination for health issues on a day to day basis.

In Rural Areas

In the rural areas, the block health supervisors and health inspectors, along with the rest of the district public health team, are able to provide technical and other support to the rural local bodies (panchayats) in their work.

(i) Directorate of Public Health Seconds Health Officers to Larger Municipalities: In the 37 largest municipalities, public health services are managed by municipal health officers (MHOs) seconded from the Directorate of Public Health. The MHOs are supported by a staff of sanitary inspectors. In smaller municipalities, public health services are managed by a sanitary officer, while the smallest towns are served only by a sanitary inspector. Functions of the staff are: (1) disease prevention, control and management, (2) detection and abatement of nuisances, (3) food safety assurance, (4) monitoring environmental hazards and civic hygiene, e.g., management of solid and liquid wastes, and (5) collection of vital registration data. The MHO and DDHS are also responsible for providing technical support and oversight of the urban maternal and child health services, which are provided by municipal hospitals and dispensaries. By seconding MHOs to urban areas, the Directorate of Public Health provides municipalities with professional public health management. The municipalities are coming under directorate of public health.

(ii) DDHS Takes Residual Responsibility for Municipal Public Health: The DDHS holds regular meetings with the person in charge of public health in all the cities and towns in the district. They must report to the DDHS on all public health matters. S/he monitors their work and gives them technical support and additional human resources as needed to carry out their work.

(iii) Three Staff Nurse Model

Under RCH I this model was introduced by Tamil Nadu between 2001-06 for the PHCs, a qualified staff nurse has been made available in 8 hours shift. Hence three nurses are available on rotation shift so that made the PHC to be open for 24 hours. As a result almost 30-35% of the institutional deliveries are conducted in the PHCs here. Tamil Nadu is the first state in India which introduced this model in the PHCs to make them functional 24*7.

Need for improvement

Public health systems need periodic reassessment and upgrading. Similarly, the Public Health Act needs updating. The potential for protecting urban public health will be much enhanced by restoring the health authorities' administrative control over municipal public health staff. Proper implementation of stated programs, schemes and rules and regulations are only channels of change in public health that require inbuilt system of monitoring and supervision, quality control and involvement of people. At all level the human

resource management need to be further strengthened. Male health workers need to be recruited and trained for public health work particularly environmental health.

Failure of Public Health Sector

The major reasons of choosing the public health services by people are inexpensive and available infrastructure with close proximity. However, effectiveness of health system depends on quality of services which is largely neglected. Patients are using public health services but majority do not satisfied. Patient's satisfaction depends upon many factors such as quality of clinical services provided, availability of medicine, behavior of doctors and other health staff, cost of services, hospital infrastructure, physical comfort, emotional support, and respect for patient preferences (Jenkinson et al 2002). In spite of NRHM, urban residents, who make up 28 per cent of India's population, have access to 66 per cent of the country's available hospital beds, according to the study by IMS Institute for Healthcare Informatics. The distribution of healthcare providers including doctors, nurses and pharmacists is highly concentrated in urban areas and the private sector. The physical reach of any healthcare facility is a challenge in rural areas, particularly for patients with chronic ailments. Patients in rural areas must travel more than five km to access an in-patient facility 63 per cent of the time, the study found. the cost of treatment at private healthcare facilities is between two and nine times higher than at public facilities, thus leading to debt burden on the poor (Arti dhar. The Hindu 2013).

In spite of huge infrastructure, the improvement in the health status is not according to international standards, which could be due to various factors:

1. Poor goal setting and lack of formulation of strategic interventions,
2. Management failures,
3. Limited role of the state,
4. Lack of focus and more vertical programs than horizontal programs,
5. Weak Evidence-Based planning for Intervention,
6. Inadequate capacity to plan and implement at the centre, state and district levels,
7. Absenteeism from place of work,
8. Quality of service delivery-an imbalanced mix of inputs,
9. Lack of policies for human resource development,
10. Limited promotional avenues,
11. Poor payment systems and dual practices,
12. Poor facilities at work,
13. Corruption, and
14. Lack of Discipline.

Health System Reform of Public Sector

Structural reform: There is an urgent need to establish new institutions, such as an autonomous institute for health information and disease surveillance, a food and drug authority, a social health insurance corporation to take care of government employees, and labor in the organized sector by merging the CGHS and the ESI; enable the Indian Council of Medical Research (ICMR) to have more autonomy by generating its own resources; and outsourcing all procurement work to professional bodies. Hence there is a need of health regulation. However, drawing up legislation in a sector like health is complex and requires an understanding of the impact of incentives or disincentives on human behavior and detecting a balanced approach. If the legislation is too inflexible and specific, putting all risks on the provider, then it may result in mindless litigation, increasing defensive medicine and higher costs for the patient, endanger the patient-doctor relationship which should be based on trust and entail harassment and outright corruption at the hands of the bureaucracy. If, on the other hand, it is too considerate to provider concerns, the patient may end up getting shortchanged. Besides, it is the enforcement of the laws that is more important.

Supervision requires to be supportive, not prescriptive or faultfinding as the objective is not to drive away the providers but to persuade and convince them of the need to adhere to quality and patient safety. This calls for a different mindset to be cultivated through intensive training programs and performance monitoring systems. Supportive supervision is a new skill that needs to be nurtured in the government sector. Efforts should be made to reduce the patient load at the higher level facilities so that doctors and other staff can give more attention and time to the patients and lower level staff need training in communication.

Enforcement of rules and regulations: The key challenge to governance is the enforcement of regulations related to the 'quack' or the unqualified practitioner in

the villages. In a setting where the public health system does not function optimally /well and the private sector is too expensive, it is this quack who enjoys social consent. Good governance would require a political will to resolutely enforce discipline and make the public health system work, besides educating the people on the rational use of medical practices or drug use.

Medical Education: Another challenge is the reorientation of medical education to be suitable for the community requirement. Medical graduate and postgraduates should be trained to handle problems in the community. It has been realized by the task force on medical education for the National Rural Health Mission that curriculum should consist of communication skills, psychology, political science, anthropology and sociology, health economics, and ethics and human rights (Govt. of India 2007).

Decentralization: It is defined as "the transfer of formal responsibility and power to make decision regarding the management, production, distribution and/or financing of health services, usually from a smaller to a larger number of geographically or organizationally separate actors". It can be of 5 types:

1) Devolution: means decentralization to a lower level political authorities such as regions or municipalities;
2) De-concentration: transfer of responsibilities and power from smaller to larger number of administrative actors.
3) Bureaucratization: transfer of responsibility and power from political level to administrative level. It is also called functional decentralization.
4) Delegation and autonomization: refers to transfer of selected functions to more or less autonomous public organizational management.
5) Privatization: It exists when responsibility for particular function is transferred from public to private actors either permanently (purchase) or for a time period (contractual).

All types of decentralization has been experimented in India in health sector. The experience of District Societies has been claimed to be positive as it has enabled better absorption of funds and quicker implementation. The experience of district societies is now being used to integrate them into District Health Societies so as to facilitate district level health planning and monitoring activities to achieve health goals.

The societies also need better expertise, persons trained in health economics, financial planning, statistics and data analysis, epidemiology, etc. In the absence of such expertise and evidence-based planning, the tendency is to merely repeat what was being done earlier, nullifying the benefits of a bottom-up planning concept.

Decentralization to local bodies has been under consideration for several years but has never been implemented in its true spirit due to various reasons. Experience shows that unless the local bodies are provided funds, specific responsibilities and powers, the benefits of decentralized systems cannot be fully realized.

Private Health Sector

The dominance of the private sector in the health care delivery system in India is well known. In a NSS survey in 2001-02, all practitioners (approximately 20 lakh), from sole practitioners to the largest hospitals, from ISM to allopathy, from qualified to unqualified quacks in the private sector are working in 13 lakh enterprises excluding public sector. Own-account enterprises are 80% of the total facility in the country. The number of government health establishments in the country is 2.3 lakh, which account for less than 20% of the total health establishments. This workforce is just 1% of the total general workforce in India, around 2.5% of the overall service sector workforce and around 6.5% of the total workforce engaged in community, social and personal services. Nonprofit health institutions in India is just 1.3% of the total enterprises working in health.

In a survey following facts were found:

1. A highly skewed distribution of resources-88% of towns have a facility compared to 24% in rural areas, with 90% of the facilities manned by sole practitioners.
2. The private sector has 75% of specialists and 85% of the technology in their facilities.
3. The private sector accounts for 49% beds and an occupancy ratio of 44% whereas the occupancy rate is 62% in the public sector.
4. Acute shortage of human resources with a national average of 0.59 for doctors against the global norms of 2.25 per 1000 population. Nearly 2/3rd of these doctors are concentrated in urban areas. Of the 80 blocks surveyed, 35 have a negligible to nil numbers of nurses or doctors either in the public or private sector.

5. 75% of service delivery for dental health, mental health, orthopedics, vascular and cancer diseases and about 40% of communicable diseases and deliveries are provided by the private sector.

Private health providers are profoundly affected by several factors: nature of health financing and payment system, types of technology, cost of initial education and training, public expectations and perceptions, regulatory frameworks, societal values, etc. International experience shows that the private sector tends to focus on profit maximization and is hardly concerned with public health goals, making state intervention essential. Recent development in the field of medical tourism, entry of corporate sector in health and drugs, have raised the cost of health care in the country and generate pressures for increased budgetary allocations for government hospitals to stay competitive.

Public Health Expenditure

The total annual expenditure for national health sector is of the order of 5.1% of the GDP, which is lower than the average for lower and middle income countries. But, public health expenditure barely reaches 17% of the total health expenditure (0.9% of GDP or Rs. 220 per capita) and the more regressive fact is that 68.8% of the total health expenditure is "out of pocket" expenditure (Table 1.1). This level of public health expenditure is extremely unfavorable because the lower and middle income countries of the globe spent an average 2.8% of GDP and even impoverished sub-Saharan countries spent 1.7% of GDP on public health (Govt of India 2009).

Only 11% of the population of the country is protected by any type of health security scheme. Improvement in quality and accessibility of health services provided by the government is likely to reduce out of pocket expenditure. On an average a person who is hospitalized spends more than 50% of his/her annual income on health; 24% of those hospitalized fall below the poverty line as a result of the financial blow and out of pocket expenses can push 2.2% of the population below the poverty line in a year.

HEALTH SERVICES IN DELHI

Delhi is predominantly urban and the administrative structure in Delhi is a little different (unlike the other states, both the state and district headquarters are located at the same place), the infrastructure of health services is as follows:

1. At the primary health care level: Delhi has wide network of 969 dispensaries providing primary health care through Delhi government, the MCD, the NDMC, the cantonment board and CGHS, ESIC, Railways, Delhi Jal Board, etc. Besides there a number of supplementary health services available like the school health clinics, mobile dispensaries. There are large number of private clinics run by registered medical practitioners of allopathic, homeopathic, ayurvedic, unani, and same numbers of unregistered practitioners.

2. At the secondary and tertiary health care level: there are 706 hospital including 550 registered nursing homes with 33711 beds. There are 118 hospitals in the government sector in Delhi. 31 hospitals are being run by the Govt. of NCT Delhi, 53 by MCD, and 4 by NDMC. Besides there are a number of 24 central government hospital including ESIC, railways, etc. Delhi's bed-population ratio is 2.07 beds per 1000 population which is better as compared to the national average of less than one per 1000.

Various National Programs are being implemented in Delhi under different modes and agencies. These include the Reproductive and Child Health (RCH) program, National AIDS Control Program, Revised National TB Control Program, National Leprosy Eradication Program, Integrated Disease Surveillance Program, National Cancer Control Program, National Mental Health Program, National Iodine Deficiency Disorders Control Program and the National Vector Borne Diseases Control Program. Beside these, there are various state public health programs and schemes implemented by Directorate of Health Services, Delhi Government including a) Antismoking, b) biomedical waste management, c) anti-quackery, d) disaster management, e) grant-in-aid to NGOs, f) thalassemia control program, g) prevention and control of MDR-TB, h) Anti-Flourosis program, i) school health scheme, j) mobile health scheme, k) state health intelligence bureau, and Delhi Arogya Nidhi, etc.

Weak areas in Health Care

Health indicators of Delhi are much better than average national indicators. Nevertheless there are certain areas of concerns which need to be attended

to. These include providing health care facilities to a large urban slum population which constitutes almost 15% of the Delhi's total population. The average male to female ratio which is 1000: 821 should be seriously considered because the national average is 1000:933. Almost 33% of the patients visit the government hospitals in Delhi. There is an ever increasing demand for beds and health services from neighboring states also. As in other states there are numerous vertical scheme in the health sector being implemented simultaneously. Further in Delhi, while some of the schemes are implemented by the government of Delhi, some of them are being implemented by the MCD and some are directly implemented by the central government. Therefore there is a need of integrated and coordinated approach to regulate and strengthen the health sector in Delhi through realignment of existing structure and procedures for better synergisation of available resources.

PRADHAN MANTRI SWASTHYA SURAKSHA YOJANA (PMSSY)

The Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) has been approved in March 2006 with the objective of correcting the imbalances in availability of affordable/reliable tertiary level healthcare in the country in general and to augment facilities for quality medical education in the under-served States. The PMSSY envisages:-

(i) Setting up of 6 AIIMS like institutions one each in the States of Bihar (Patna), Madhya Pradesh (Bhopal), Orissa (Bhubaneshwar), Rajasthan (Jodhpur), Chhattisgarh (Raipur) and Uttaranchal (Rishikesh) at an estimated cost of Rs.332 Crores per institution. Each institution will have a 850 bedded hospital intended to provide healthcare facilities in 39 speciality/super-speciality disciplines. Each medical college will have 100 Undergraduate intake besides facilities for imparting postgraduate /doctoral courses in various disciplines.

(ii) Upgradation of the following 13 existing medical institutions with an outlay of Rs.120 Crores per institution, of which Rs.100 Crores would be borne by the Central Govt. and the remaining Rs.20 crore by the respective State Governments:

1. Govt. Medical College, Jammu (J&K)
2. Govt. Medical College, Srinagar (J&K)
3. Kolkatta Medical College, Kolkatta (WB)
4. Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow (UP)
5. Institute of Medical Sciences, BHU, Varanasi (UP)
6. Nizam Institute of Medical Sciences, Hyderabad (AP)
7. Sri Venkateshwara Institute of Medical Sciences, Tirupati (A.P) (50% cost of upgradation will be borne by the TTD Trust)
8. Govt. Medical College, Salem (TN)
9. Patliputra Medical College & Hospital, Dhanbad (Jharkhand)
10. B.J. Medical College, Ahmedabad (Gujarat)
11. Bangalore Medical College, Bangalore (Karnataka)
12. Grant Medical College & Sir J.J. Group Of Hospitals, Mumbai, (Maharashta)
13. Medical College, Thrivananthapuram, (Kerala) The Scheme would be implemented by 2009-10.

RASHTRIYA SWASTHYA BIMA YOJANA (RSBY)

Rashtriya Swasthaya Bima Yojana is a Central Government Scheme announced by the Prime Minister on August 15, 2007 (Govt. of India). It is a new health insurance scheme for the Below Poverty Line (BPL) families in the unorganized sector. RSBY covers more than 700 in patient procedures with a cost of up to Rs. 30,000/ per annum for a nominal registration fee of Rs. 30/ Cashless coverage, absence of any bar based on pre exisitinq conditions and age limit are other unique features of this scheme. A total of 2.4 crore families have been covered under RSBY and over 8600 health care providers are enrolled in the selected districts across 29 States and Union Territories. Preexisting medical conditions are covered and there is no age limit. Coverage extends to the head of household, spouse and up to three dependents (called as one family). If the family size is more than five, the head of the family would decide as to who all should be left out. Transportation cost of Rs. 100/ per visit with an overall limit of Rs. 1,000/ per annum is also admissible under the scheme.

State governments engage in a competitive bidding process and select a public or private insurance company licensed to provide health insurance by the Insurance Regulatory Development Authority (IRDA). The insurer must agree to cover the benefit package prescribed by GOI through a cashless facility that in turn requires the use of smart cards which must be issued to all members. This requires that a sub-

contract be arranged with a qualified smart card provider. The insurer must also agree to engage intermediaries with local presence such as NGOs etc. in order to provide grassroots outreach and assist members in utilizing the services after enrolment. The insurer must also provide a list of empaneled hospitals that will participate in the cashless arrangement. These hospitals must meet certain basic minimum requirements (e.g., size and registration) and must agree to set up a special RSBY desk with smart card reader and trained staff. The list should include public and private hospitals.

The financial bid is essentially an annual premium per enrolled household. The insurer is compensated on the basis of the number of Smart Cards issued, i.e. households covered. Each contract is specified on the basis of an individual district in a state and the insurer agrees to set up an office in each district where it operates. While more than one insurer can operate in a particular state, only one insurer can operate in a single district at any given point in time.

An electronic list of eligible BPL households is provided to the insurer according to a prespecified format. The list is posted in each village prior to the enrollment and the date and location is publicized in advance. Mobile stations are set up at local centers (e.g., public schools). These stations are equipped with the hardware required to collect biometric information (fingerprints) of the members of the household covered and to print smart cards with a photo. The smart card along with an information pamphlet describing the scheme and the list of hospitals is provided on the spot once the beneficiary has paid the 30 rupee fee.

Three individuals must be present at each enrollment: A district-level, state government officer is present and must insert his own, centrally-issued smart card to verify the legitimacy of the enrolment.

The OPD facilities are not covered under this scheme. Common exclusions have been listed out in the detailed Guidelines. These common exclusions include:

- Conditions that do not require hospitalization
- Congenital external diseases
- Drug and Alcohol Induced illness
- Sterilization and Fertility related procedures
- Vaccination
- War, Nuclear invasion
- Suicide
- Naturopathy, Unani, Siddha, Ayurveda

The smart card entitles its bearer to a list of pre-specified inpatient services in the second month following enrollment. The beneficiary can be transferred to another empaneled hospital and so long as there is amount available in the insurance cover, the beneficiary will not bear the cost. The second network hospital will pay the amount for the concerned insurance company.

In case of death of head of the family, the card can continue to operate for other members of the family and similarly death of a family member will allow another member who was not originally listed in the card. However, the name of this additional member should have been there in the BPL database available at the time of enrollment. If the bill goes beyond Rs.30,000/ , the cost thereof shall be borne by the beneficiary.

ELEVENTH PLAN FOR PUBLIC HEALTH CARE DELIVERY SYSTEM

Following recommendations are made for 11th Five Year Plan:

1. Access to clean drinking water will need to be planned and rigorously implemented.
2. Need to take stock of the habitation survey on Rural Water Supply System that was conducted in 2003 which has indicated large incidences of slippage from fully covered to partially/ not covered categories due to a number of factors such as services going dry, lowering of ground water levels, system outliving their lives and increase in population resulting in lower global per capita availability. The action plan under drinking water supply would then need to be suitably redesigned and operationalized.
3. Sanitation is another important factor decelerating improvements in health status. The position regarding connectivity for waste water across different States is alarming and would need to be addressed on priority in coordination with the Department of Drinking Water and Sanitation as lack of adequate sanitation is responsible for several health problems. In fact cholera, dysentery, typhoid, infectious hepatitis and many

other diseases can be traced to the unsanitary disposal of human excreta. ASHA should have a bathroom in her house which could be taken as indicator of minimum sanitation in the area.

4. The social consequences of lack of sanitation has given rise to manual scavenging which is banned. A sanitation movement both in the interest of social equity and prevention of diseases is to be taken up on a priority basis. All dry buckets should be converted to two pit compost flush toilet. All sanitation workers are to be provided with protective gear and medically examined annually.
5. Explore replicating on a large scale the experience of Sulabh Shauchalaya (Community Latrines).
6. Consider introducing toilet complexes where they are not already available with biogas plants in district/taluka hospitals and CHCs.
7. Introduce environmental sanitation in all schools in the rural areas/urban slums etc.
8. To promote health education and awareness particularly with respect to drinking water and sanitation, consider the SWAJAL Project which aims at providing drinking water in rural areas but covering a range of development initiatives including non-formal education, hygiene and environmental sanitation awareness and women's development initiatives.
9. Distribution of key micronutrients and addressing the problem of nutrition and anemia among women and children.
10. Building up an effective health system capacity so as to clearly focus on important health outcomes spelt out in National Health Policy 2002. The outputs to be achieved and outcomes projected to be in line with the MDGs.
11. Broader range of drug regimens to be considered. A systematic effort to be made to analyze approaches which work and those which do not.
12. Promote high volume care for lower surgical procedures like cataract surgery where lower level workers could be appropriately trained to substitute for more expensive and difficult cases/surgeries.
13. Promotion of exercise and yoga as stress reducing factors to help in arresting obesity, diabetes and other life-style diseases.
14. Need to bring about a shift from specific project to program support. Also ensure that releases are performance based with focus on final outcomes as in the case of RCH Phase-II.
15. Focus public resources for revitalizing and strengthening public facilities in disadvantaged areas and consider the feasibility/desirability of purchasing curative care from the private sector.
16. Professionalize service delivery by appropriate measures for increasing the number and quality of medical and nursing colleges.
    - Ensure distributive equity across States by encouraging establishment of new medical colleges where there is a shortage.
    - Increase public investment in the poor performing States to establish medical/nursing colleges or alternatively provide incentives to the private sector to set them up and regulate them effectively so as to ensure that there is no compromise in the standards and quality of care.
    - Draw up an action plan to fill up the vacancies of the teaching faculty in medical colleges.
    - Consider reviving the scheme of reorientation of medical education program for preparing doctors to work in rural communities.
    - Improve payment systems and design suitable incentives particularly housing and other facilities for retaining skilled doctors and specialists from moving into the private sector.
17. Better motivation and periodic training for multipurpose workers and ANMs. Improvements should also effect the quality of training for nurses. According to the National Commission for Macroeconomic and Health in 2004, 61.2% of nursing schools/colleges were found to be unsuitable for teaching. Though these were de-recognized by the Indian Nursing Council they have no impact as they continue to function with a permission of State Nursing Council.
18. Uniform system of reporting of data by the State and their validation is very essential for policy making. The format designed for NRHM would be the starting point but efforts will need to be made to monitor data relating to outputs set against the outcomes envisaged. This will involve coordinating with other related Departments as public health services including water and sanitation cuts across different players at the Central and State levels.
19. Availability of timely data on physical progress would have a bearing on the allocations to be made under different services/segments within and outside health. The impact of these changing

allocations alongwith expenditure incurred will need to be tracked appropriately through matrices in national health accounts. The National Health Accounts brought out for 2001-02 should be continued on an annual basis and systematically refined to act as a tool to policy makers for making investment decisions and tracking financial flows in the health sector.

PUBLIC PRIVATE PARTNERSHIP (PPP) IN HEALTH

The Private and Nonprofit sectors are also very much accountable to overall health systems and services of the country. Therefore, synergies where all the stakeholders feel they are part of the system and do everything possible to strengthen national policies and programs needs to be emphasized with a proactive role from the Government. "Public" generally refers to government or organizations functioning under State budgets, "Private" refers to the Profit/Nonprofit/ Voluntary sector and "Partnership" would mean a collaborative effort and reciprocal relationship between two parties with clear terms and conditions to achieve mutually understood and agreed upon objectives following certain mechanisms.

PPP however would not mean privatization of the health sector. Partnership is not meant to be a substitution for lesser provisioning of government resources nor an abdication of Government responsibility but as a tool for augmenting the public health system. Over the years the private health sector in India has grown markedly. Today the private sector provides 58% of the hospitals, 29% of the beds in the hospitals and 81% of the doctors. *(The Report of the Task Force on Medical Education, MoHFW).* The private providers in treatment of illness are 78% in the rural areas and 81% in the urban areas. The use of public health care is lowest in the states of Bihar and Uttar Pradesh. The reliance on the private sector is highest in Bihar. 77% of OPD cases in rural areas and 80% in urban areas are being serviced by the private sector in the country. *(60th round of the National Sample Survey Organization (NSSO) Report.*

The success of health care in Tamil Nadu and Kerala is not only on account of the Public Health System. The private sector has also provided useful contribution in improving health care provision. Studies of the operations of successful field NGOs have shown that they have produced dramatic results through primary sector health care services at costs ranging from Rs. 21 to Rs. 91 per capita per year (NSSO 60th Round)

The quantum of health services the private sector provides is large but is of poor and uneven quality. Services, particularly in the private sector have shown a trend towards high cost, high tech procedures and regimens *(Report of the Task Force on Medical Education, MoHFW).*

Given the overwhelming presence of private sector in health, there is a need to regulate and involve the private sector in an appropriate public-private mix for providing comprehensive and universal primary health care to all. However there is an overwhelming need for action on privatization of health services, so that the health care does not become a commodity for buying and selling in the market but remains a public good, which is so very important for India where 1/3 of the population can hardly access amenities of life, leave alone health care.

Objectives of Public Private Partnerships

- Universal coverage and equity for primary health care
- Improving quality, accessibility, availability, acceptability and efficiency of health services
- Exchange of skills and expertise between the public and private sector
- Mobilization of additional resources
- Improve the efficiency in allocation of resources and additional resource generation
- Strengthening the existing health system by improving the management of health within the government infrastructure
- Widening the range of services and number of services providers.
- Clearly defined sharing of risks
- Community ownership

Public-Private-Partnership Models

- Contracting :
  - Contracting out
  - Contracting-in, e.g. human resource in almost all states
- Franchising :
  - Partial franchising

Full franchising
Branded clinics, e.g. Butterfly clinic, Titli clinic in Bihar, MP

- Social marketing
- Joint ventures
- Voucher schemes
- Hospital autonomy
- Partnership with corporate sector/ industrial houses, e.g., CII, FICCI
- Involving professional associations, e.g., IAPSM, IPHA (RCH Training), FOGSI (Vandematram), IMA (Aao Gaon Chalein)
- Build, operate and transfer
- Donation & philanthropic contributions
- Involvement of social groups and clubs-rotary club, Lions club
- Partnership with cooperative societies
- Partnership for capacity building
- Partnership with nonprofit community-based organizations
- Running mobile health units
- Community based health insurance

Existing Scenario of PPP

Public-Private Partnership has emerged as one of the options to influence the growth of private sector with public goals in mind. Following documents have emphasized the need of PPP: Tenth Five Year Plan (2002-2007), National Health Policy-2002, in different National Health Programs like RNTCP, NPCB, NLEP, RCH, etc. and National Rural Health Mission (NRHM 2005-2012).

During the last few years, the Centre as well as the State Governments have initiated a wide variety of public-private partnership arrangements to meet the growing health care needs of the population under five basic mechanisms in the health sector:

- *Contracting-in*: government hires individual on a temporary basis to provide services
- *Contracting-out:* government pays outside individual to mange a specific function
- *Subsidies*-government gives funds to private groups to provide specific services
- *Leasing or rentals*-government offers the use of its facilities to a private organization
- *Privatization*-government gives or sells a public health facility to a private group

A. Partnership between the Government and the *For-Profit* sector

1. Sawai Man Singh Hospital, Jaipur has established a Life Line Fluid Drug Store to contract out low cost high quality medicine and surgical items on a 24-hour basis inside the hospital. The SMS Hospital has also contracted out the installation, operation and maintenance of CT-scan and MRI services to a private agency. The agency is paid a monthly rent by the hospital and the agency has to render free services to 20% of the patients belonging to the poor socioeconomic categories.
2. The Uttaranchal Mobile Hospital and Research Center (UMHRC).
3. Contracting-out of IEC services to the private sector by the State Malaria Control Society in Gujarat
4. Contracting-in of services like cleaning and maintenance of buildings, security, waste management, scavenging, laundry, diet, etc. to the private sector has been tried in states like Himachal Pradesh; Karnataka; Orissa (cleaning work of Capital Hospital by Sulabh International); Punjab; Tripura (contracting Sulabh International for upkeep, cleaning and maintenance of the G.B. Hospital and the surrounding area); Uttarakhand, etc.
5. The Government of Andhra Pradesh has initiated the Arogya Raksha Scheme in collaboration with the New India Assurance Company and with private clinics.

B. Partnership between the Government and the *Non-Profit* sector

1. Involvement of NGOs in the Family Welfare Program: The MNGO (Mother NGO) and SNGO (Service NGO) Schemes are being implemented by NGOs for population stabilization and RCH. 102 MNGOs in 439 districts, 800 FNGO (Field NGO)s, 4 regional Resource Centers (RRC) and 1 Apex Resource Cell (ARC) are already in place. The MNGOs involve smaller NGOs called FNGOs in the allocated districts.
2. The Municipal Corporation of Delhi and the Arpana Trust (a charitable organization registered in India and in the United Kingdom) have developed a partnership to provide comprehensive health services to the urban poor in Delhi's Molarbund resettlement colony.
3. Management of Primary Health Centers in

Gumballi and Sugganahalli was contracted out by the Government of Karnataka to Karuna Trust in 1996 to serve the tribal community in the hilly areas.

4. The Government of Tamil Nadu has initiated an Emergency Ambulance Services scheme in ten districts of Tamil Nadu in order to reduce the maternal mortality rate in its rural areas.
5. The Urban Slum Health Care Project: The Andhra Pradesh Ministry of Health and Family Welfare contracts NGOs to manage health centers in the slums of Adilabad.
6. A collaboration has developed between Government of Arunachal Pradesh, VHAI and Karuna Trust in managing significant number of PHCs.

C. Partnership between the Government and a private service provider

1. Partnership between the Department of Family Welfare and Private Service Providers:

- The DFW has appointed one additional ANM on contractual basis in the remote sub-centers (which constitute 30% of all sub centers in C category districts in 8 states) to ensure better emergency obstetric care under the RCH program.
- Public Health/Staff nurses have been appointed on a contractual basis at PHCs/ CHCs having adequate infrastructure for conducting deliveries.
- In order to plug deficiencies in providing emergency obstetric care at FRU due to non-availability of anesthetist for surgical interventions, states have been permitted to engage the anesthetist from the private sector on a payment of Rs.1000 per case at the subdistrict and CHC level.
- With a view to supplement the regular arrangement, provision has been made for engaging doctors trained in MTP as Safe Motherhood Consultant who will visit the PHC (including CHCs in NE states) once a week or at least once in a fortnight on a fixed day for performing MTP and other maternal health care services. These doctors will be paid @Rs.500 per day visit.
- The Haryana Urban RCH Model is being implemented in 19 urban slums and benefits 15 lakh beneficiaries. In this model, a private health practitioner (PHP) has been identified to provide comprehensive primary health care service to a group of 1000-1500 targeted beneficiaries. S/he provides services related to national disease control program, contraception, immunization, ambulatory care. The PHP gets an incentive of Rs. 100 p.a. per beneficiary by the Government.

D. Partnership between the Government and a private sector and/or the nonprofit sector and/or a private service provider and/or multilateral agencies

1. The National Malaria Control Program has involved the NGOs and private practitioners at the district level for the distribution of medicated mosquito nets.
2. Under the National Blindness Control Program, District Blindness Control Societies have been formulated, which are represented by the Government, non-government and private sectors. The NGOs have been involved for providing a package of services
3. The National AIDS Control Program has involved both the voluntary and private sector for outreaching the target population through Targeted Interventions.
4. The Revised National Tuberculosis Control Program has involved the private practitioners and the NGOs for the rapid expansion of the DOTS strategy.
5. The Rajiv Gandhi Super-specialty Hospital in Raichur Karnataka is a joint venture of the Government of Karnataka and the Apollo hospitals Group, with financial support from OPEC (Organization of Petroleum Exporting Countries).
6. The Government of Karnataka, the Narayana Hrudalaya hospital in Bangalore and the Indian Space Research Organization initiated an experimental tele-medicine project called 'Karnataka Integrated Tele-medicine and Tele-health Project' (KITTH), which is an on-line health-care initiative in Karnataka.
7. The Yeshasvini Co-operative Farmer's Healthcare Scheme is a health insurance scheme targeted to benefit the poor. It was initiated by Narayana Hrudayalaya, super-specialty heart hospital in Bangalore, and by the Department of Cooperatives of the Government of Karnataka.

8. A Rogi Kalyan Samiti (RKS) was formed in Bhopal's Jai Prakash Government Hospital to manage and maintain it with public cooperation.
9. A public/private DOTS model was established on a pilot basis in Hyderabad at Mahavir Trust Hospital, which is a private nonprofit hospital. This partnership also involves private service providers like doctors and nursing homes. This new approach is known as PPM DOTS (Public Private Mix DOTS).
10. Multilateral organizations like the World Bank and the European Commission have supported the Sector Investment Program and the Department of International Development (DFID) in the area of health sector reforms in India.

Challenges faced in Operationalization

Lack of resources remains a big concern. The evidence also reveals great disparity in services and in remuneration. It is seen that in most partnerships, the State Health Department is the principal partner with rare stakeholder consultation. In most cases it signs contracts with very few cases of Hospital Management Societies signing the contracts in a decentralized manner. True partnerships in sense of equality amongst partners, mutual commitment to goals, shared decision making and risk taking are rare. There is an absence of representation of the beneficiary in the process, lack of effective governance mechanisms for accountability, non transparent mechanisms, lack of appropriate monitoring and governance systems and institutionalized management structures to handle the task. It is seen that the success or failures of the initiatives are as much dependant upon the above issues as on the political environment, legal framework of the negotiation, the capabilities of the partners, the risks and incentive each party incurs, funding and the payment mechanisms, cost and price analysis prior to negotiation, standardization of norms, performance measurement and monitoring and evaluations systems.

The potential areas may be as follows:

- Services, disease control and surveillance, diagnostics and medicines.
- Infrastructure
- Health human resource
- Behavior change communication
- Capacity building including training and systems development.
- Managerial service and auxiliary activities of the health sector

As is evident, partnership mechanisms do not work without *quality assurance* and an enabling environment. Government must ensure that providers are *accredited*, at least essential standards are set and followed, *guidelines and protocols* for diagnosis and treatment are developed and used, and providers are kept updated through *continuing medical education*. System must *monitor* and correct such important aspects of quality as infection prevention, *client satisfaction* and access to services. For enablement the government must understand the advantages, disadvantages and requirements of partnership. They need to understand that partnerships are based on common objectives, shared risks, shared investments and participatory decision-making.

COMMENTS

Resurrect the Public Health System

There is a need for the public sector to take a central role because of following:

1. People have right to health care that is not dependent on ability to pay or the vagaries of the market. Governments are critical to ensure that these rights are fulfilled. Public sector health services are people's ultimate recourse for health care, especially poorer people. But public services must not become marginalized as 'poor care for the poor'.
2. Equitable and efficient health care systems require careful organization- fragmented, disorganized and market-driven health care systems are inefficient and inequitable.
3. Adequately financed public service offers the best means of breaking the link between the income of health care providers and the delivery of health care, avoiding the harm associated with 'commercial behavior'. There is also evidence that the larger the role of the public sector in the health care systems, the better the outcome (Macintosh ad Koivusalo 2004). Per capita health expenditure is directly realted to life expectancy at birth (Figure 5.3.) Healthy life expectancy (HALE), for instance, is significantly higher, and child mortality significantly lower, in countries with lower levels of private health expenditure relative to public expenditure (Figure 5.4).

Countries that spend more of their GDP on health through public expenditure or social insurance also have significantly better outcomes in terms of HALE and child mortality (Figure 5.5). Similar impact of public spending on health and education on human development index has been found (Figure 5.6).

Health Systems Development

Valuing and revitalizing the public sector works-the life-blood of health services: Changing and improving how health personnel behave and function is central to the rebuilding of health services.Improved health worker performance can be made by following:

- Adequate supplies of essential equipment, consumables and medicines
- Systematic quality improvement program, including the training of staff in health service quality, interpersonal relations and responsiveness of care;
- Support for health workers, especially those who work in isolated and difficult circumstances;
- A participatory style of health service management;
- An incentive structure of professional rewards for good performance.

There should be clear rules, sanctions that must signal that thefts, unethical practices, and uncaring and abusive behavior towards patients, especially the poor woman, elderly and ethnic minorities, will not be

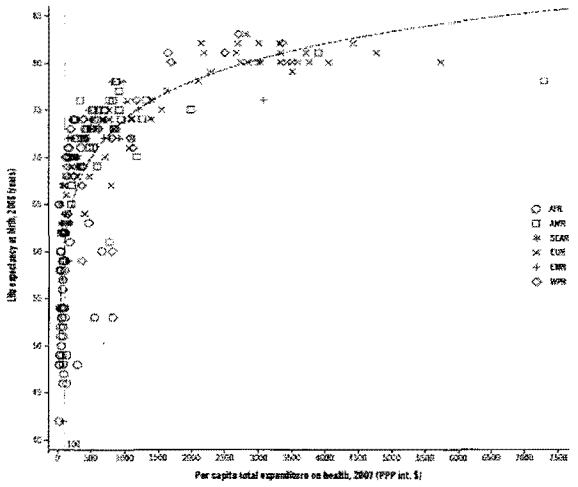


Figure 5.3. Per capita health expenditure and life expectancy at birth

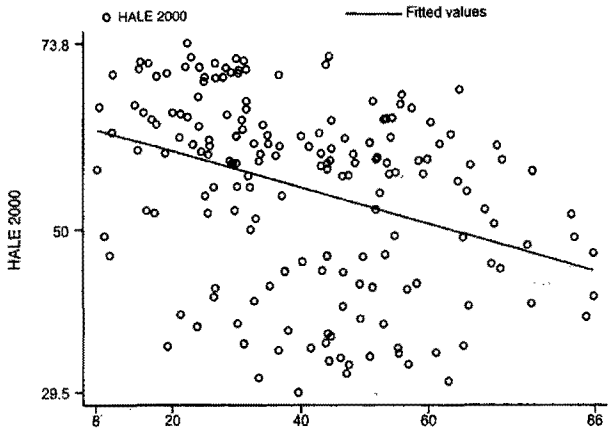


Figure 5.4. Association between HALE and private health care expenditure as a % of total health care expenditure 2000 (Source Mackintosh 2005)

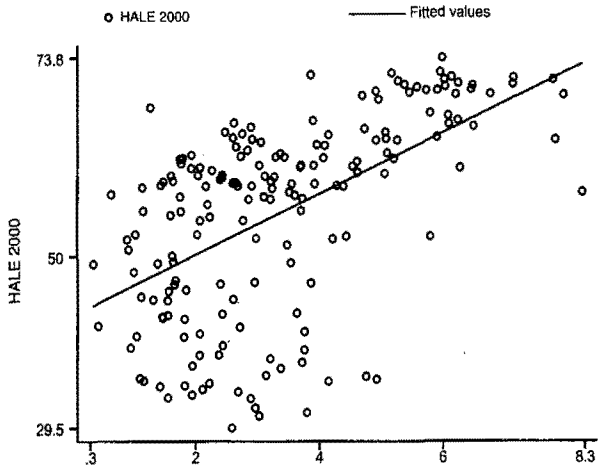
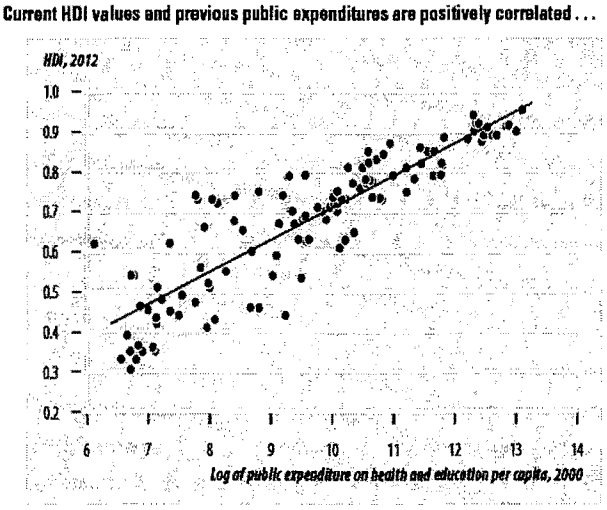


Figure 5.5. Association between HALE and government health care expenditure as a % of GDP 2000 (Source Mackintosh 2005)



tolerated. Disciplinary procedures must be consistent, fair and transparent.

Range of management tools and processes that can be employed to promote commitment, good performance and ethical behavior within public sector bureaucracies- these include nonfinancial incentives such as peer recognition and public praise of good performance; and opportunities to advance career and learning prospects.

Health care system best work with the effort of a team in which leader shares work, responsibilities and achievement. Unfortunately, management does not work efficiently. Leaders do not delegates their work to their juniors with sharing power. *Delegation* means passing responsibilities to local offices or organization outside the structure of the central governments such as quasi-public (non-government) organization, but with central government retaining indirect control. Entrustment of responsibility and authority from one person to another. Passing authority and responsibility to lower levels. The sharing or handing over of authority and responsibility to a subordinate.

Resources to achieve health for all: Adequately financed public sector health is a prerequisite to achieve health for all. External financing must, however, be guaranteed with medium-to long-term commitments, and directed in ways that will strengthen ministries of health.

Governments should strengthen their capacity to increase their tax revenue in a progressive and fair manner. Civil society must also be encouraged supported to monitor government budgetary allocations.

Financing Health for all: Health financing policies should aim to create a single national pool of funds, with the capacity cross-subsidization between high-income and low-income groups, and risk sharing, for example, between the young and the elderly. There should be no user fees for essential health care.

Regulating and shaping the private sector: In countries where bulk of health care provision is carried out by the private sector, most of it is in the form of small-scale disorganized private dispensaries and clinics. Governments do not have the capacity either to regulate this sector or to improve the quality and safety of care provided. Governments with limited resources need to use their political and legal muscle to shift disorganized and commercialized health care markets towards a more equitable and efficiently direction.

Private providers should also develop enhance professionalism, good clinical practice and ethical behavior. Government could consider working with the nonprofit private sector, licensing requirements, formal accreditation price controls. Measures should be adapted to reduce the disparity in incomes between public and private providers. This disparity should be regularly measured and monitored to draw attention to the need for measures to reduce the gap. Government should revoke or reverse any agreements that undermine their ability to regulate the health care sector.

Making the public sector work- strengthening management key elements of health systems management are:

1.Resource Management and planning (transparent policy): To ensure equitable resource allocation between geographic areas, decisions about financing and major resource allocation should be centralized and based on an equitable, population – weighted, needs- based formula.

2. Job Description of worker and professionals is lacking in public sector. It is the description of the responsibilities and authority of a position; generally states also an objective and the relationships to supervisors and subordinates. It may cover committee assignments and even standards of performance. It is a description of the duties, scope and responsibilities associated with the job. This describes the responsibilities associated with the job. This describes the job in details, indicating what the sales' man or worker will have to do including the difficulties that he may have to face in selling the company's product or serving the patient is ward.

3. Prioritizing interventions: From an equity perspective, resources should first be allocated according to the relative health care need of people.

4. Implementing PHC Programs: Health care

systems can act as the engine for such a model of health care through the appropriate design of PHC programs, cost effective medical care, aided by essential medicines lists and rational, standard treatment guidelines, as improving access to clean water; ensuring household food security; providing for adequate shelter and housing; raising levels of literacy.

5. Health Systems and Operational Research: Health systems and management research needs to become more embedded in health management and planning activities. There is also a need to invest more in the development of heath information and disease surveillance, and the capacity time for staff of public health cadre systems to conduct their own research.

6. Appropriate Timeframes: Timeframes set by international agencies and donors are often unrealistic and too short. They can lead to, for example, an overdependence on top-down vertical approaches rather than approaches that simultaneously build the longer-term capacity and sustainability of health systems.

7. Political and social mobilization for pooling of resources to urban areas. Vested interests of private players can be overcome only by a political effort. Social movements may need to bring together the concerns of several communities and to find ways of presenting collective views and concerns at the national or international level. Treatment Action Campaign in South Africa, which challenged the patent monopolies of drug companies on anti-retroviral drugs. Another example is mobilization of society against the privatization of health services in El Salvador. International NGOs should help develop the capacity and to create a academic and health institutions.

8. Public and community involvement in health care systems: For public sector bureaucracies to work effectively, efficiently and fairly, they need to be held accountable- internally through rules and codes of ethical conduct but, equally important, externally to communities and the public.

Appropriate community involvement includes community mobilization to assert rights, challenge policies and present alternatives; monitoring of services by community involvement in planning and decision-making; and involvement in the implementation of PHC programs and services that enhances the culture of consultation and respect for lay people.

Despite the economic prosperity and general improvements in health seen since 1990, profound inequalities in health persist both within and between BRICS (Brazil, Rassia, India, China, South Africa). However, the substantial reductions observed – within Brazil and China – in the inequalities in income-related levels of infant mortality are encouraging. This is not seen in India that indicates huge divide among the population in terms of availability, accessibility and quality.

9. More effective assistance from donors global initiative: More investment should be aimed at developing, and retaining a motivating public sector staff, and donors must be prepared to fund the recurrent costs of public sector health care systems in the poorest areas for at least the medium-term projects.

Donor programs and international health initiatives must translate the rhetoric of implementing disease-based programs in ways that strengthen health care systems in practice. Philanthropic agencies must recognize the need to balance investment in medical technology with the need to invest in human resources, health systems and multi-sectoral approaches to health promotion and disease prevention.

The auditing of the performance of donors and international health agencies should be encouraged.

10. An organizational framework for the health care system- the District Health System provides an organizational framework for many other recommendations. It creates a decentralized system to allow health plans and programs to be tailored to the needs and characteristics of the local population and topography. It also helps in appropriate balance between top-down and bottom-up planning.

11. Rebuilding trust: Encouraging a higher level of ethical behavior within health care systems is important because health care systems are social institutions that reflect and shape societal values. Trust is a key element of the provider-patient relationship- it is

essential that patients can trust providers to behave ethically and have their best interests at heart (Davies 1999, Mechanic 1996). Truth also facilitates patient communication, underpins the provider's role in encouraging patients to change behavior, and enables greater patient autonomy in decision-making.

ACCREDITATION OF THE HEALTH SYSTEM

Accreditation is defined as "A self-assessment and external peer assessment process used by health care organizations to accurately assess their level of performance in relation to established standard and then to implement ways to continuously improve it". "Market forces, such as medical tourism, insurance and corporate sector have accelerated the demand for quality in healthcare services. As a result, there is a growing demand from consumers for better healthcare as the lack of quality assurance mechanisms limits their access to appropriate health services".

Accreditation benefits all Stake Holders:

1. Patients are the biggest beneficiaries. Accreditation results in high quality of care and patient safety. The patients get services by credential medical staff. Rights of patients are respected and protected. Patient satisfaction is regularly evaluated.
2. Accreditation to a Hospital stimulates continuous improvement. It enables hospital in demonstrating commitment to quality care. It raises community confidence in the services provided by the hospital. It also provides opportunity to healthcare unit to benchmark with the best.
3. The Staff in an accredited hospital are satisfied lot as it provides for continuous learning, good working environment, leadership and above all ownership of clinical processes. It improves overall professional development of Clinicians and Paramedical staff and provides leadership for quality improvement within medicine and nursing.
4. Accreditation provides an objective system of empanelment by insurance and other Third Parties. Accreditation provides access to reliable and certified information on facilities, infrastructure and level of care.

1. Joint Commission International (JCI)

Joint Commission International (JCI) is a division of Joint Commission Resources (JCR), the subsidiary of The Joint Commission working since more than 50 years from now. It is the largest accreditor of health care organizations in the United States. The Joint Commission and its subsidiary are both not-for-profit corporations.

Joint Commission International (JCI) has accredited many hospitals in India. The JCI accreditation is likely to be limited to only to bigger players owning to its high cost.

2. Internationally Acclaimed Healthcare Accreditation Organization

The Joint Commission on Accreditation of Health Care Organizations (JCAHO),USA.

The Canadian Council on Health Service Accreditation (CCHSA), Canada.

The Australian Council on Healthcare Standards (ACHS), Australia.

Health Quality Services (HQS). The King's Fund Centre, England.

Council on Health Services Accreditation for South Africa (COHSASA).

The Malcolm Baldrige National Quality Award, USA. (Including the Swedish and European versions and the version modified for health care evaluation, USA).

National Accreditation Board for Hospitals & Healthcare Providers (NABH)

National Accreditation Board for Hospitals & Healthcare Providers (NABH) comes under the purview of board of **Quality Council of India**, set up to establish and operate accreditation program for healthcare organizations. The board is structured to cater to much desired needs of the consumers and to set benchmarks for progress of health industry. The board is functionally autonomous in its operation. Currently it accredits Hospitals & Nursing homes, and is expected to accreditate Blood Banks, Diagnostic Centers (Imaging), Dental Centers and Ayurvedic Hospitals/ Clinics in future. The structure and process of quality council of India have been given figure 5.6 & figure 5.7.

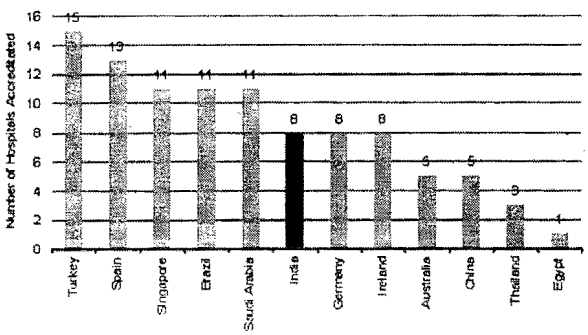


Figure 5.6 Accreditation by JCI in various Countries

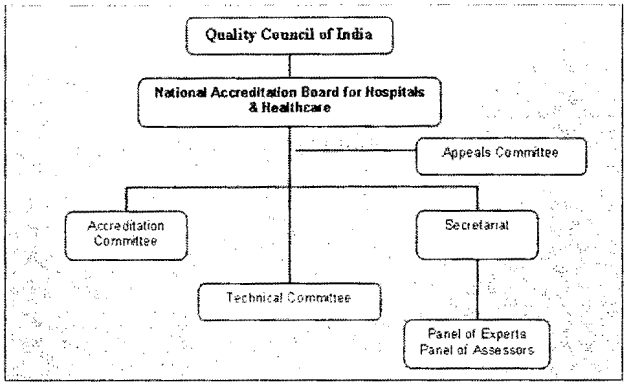


Fig. 5.7 : Quality Council of India

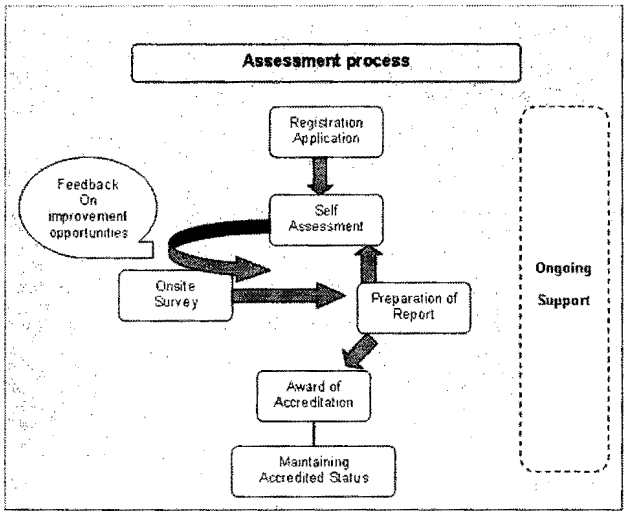


Fig. 5.8: Quality Assessment Process

Assessment Process in general

Accreditation is a voluntary process. Its standards are usually regarded as optimal and achievable. It provides a visible commitment by an organization to improve the quality of patient care, to ensure a safe environment and to continually work to reduce risks to patients and staff. Accreditation has gained worldwide attention as an effective quality evaluation and management tool.

References

ACHS. An Introduction to the US Healthcare System; National Report on Health Services accreditation Performance 2003-2006 Available at www.achs.org.au.

Asian Hospital & Healthcare Management. http://www.asianhhm.com/Knowledge_bank/articles healthcare_accreditations_india.htm.

Das Gupta, Monica, Rajendra Shukla, T V Somanathan and K K Datta (2009): "How Might India's Public Health Systems be Strengthened?", Washington DC: The World Bank Policy Research Working Paper 5140 (http://go.worldbank.org/BW6NXMA570).).

Das Gupta M, Desikachari BR, et al. How Might India's Public Health Systems Be Strengthened? Lessons from Tamil Nadu. Economic and Political Weekly 2010 March 6; vol xlv: 46-60.

Davies H (1999). Falling public trust in health service; Implications for accountability. Journal of Health Research and Policy 4:193-194.

Dhar A. Healthcare services skewed towards urban centres: Study. http://www.thehindu.com/todays-paper/tp-national/healthcare-services-skewed-towards-urban-centres-study/article4939422.ece.

Govt. of India. Report: Task force on medical education for the National Rural Health Mission. Min H 7 FW, Govt. of India New Delhi 2007.

Gyani GJ. Hospital Accreditation in India - Standardising healthcare, CEO, National Accreditation Board for Hospitals & Healthcare Providers, India.

Kishore J. A Dictionary of Public Health. 3rd edition, New Delhi: Century Publications 2013.

Mackintosh M and Tibandebage P 92004). Inequality and redistribution in health care: analytical issues for developmental social policy. In: Mkaandawire T, ed. *Social policy in a Development Context.* Basingstoke, UK, Palgrave and UNRISD.

Mechanic D (1996). Changing medical organization and the erosion of trust. *The Milbank Quarterly* 74:171-189.

NIHFW. Impact of Integrated skill training and specialized skill training under RCH program in the country. Evaluation report. New Delhi NIHFW 2004.

NIHFW. Status study of training in MCH &FW in medical colleges in India. NIHFW 1992.

Rangarao AP. Role and efficacy of ANM and male worker in primary health care in Andhra Pradesh. A qualitative study. Commissioned by the Department for International Development (DFID), India 2003.

Rao KS. Delivery of health services in the public sector. In National Commission on Macroeconomics and health (NCMH). Ministry of Health & Family Welfare, Govt. of India 2005.

Sunil Nandraj, Sri vidya,Anagha khot. Organizational framework for hospital accreditation system in India (Submitted To Ministry of Health & Family Welfare Government of India, New Delhi). WHO India

Ved RR, Dua AS. Review of women and children's health in India: Focus on safe motherhood. In. National Commission on Macroeconomics and health. Ministry of Health & Family Welfare, Govt. of India 2005.

WHO. *Responding to The Tsunami – The Tamil Nadu Experience* (Delhi: WHO Country Office), 2006:81, 83 (http://www.whoindia.org/EN/Section2/Section407.htm)).

Rao K, Bhatnagar A, Berman P. India's health workforce: size, composition and distribution. In: La Forgia J, Rao K (eds). India Health Beat. New Delhi: World Bank, New Delhi and Public Health Foundation of India; 2009.

Rural Health Statistics 2015. Ministry of Health & Family Walfare. Available at: https://nrhm-mis.nic.in/Pages/RHS2015.aspx ?RootFolder =% 2FRURAL% 20HEALTH% 20STATISTICS% 2F(A) RHS%20-% 202015 & FolderCTID =& V i e w = % 7 B C 5 0 B C 1 8 1 - 0 7 B B - 4 F 7 8 - B E 6 F - FCE916B64253%7D (accessed on: September 18, 2015).

Hagopian A, Mohanty MK, Das A, House PJ. Applying WHO's 'workforce indicators of staffing need' (WISN) method to calculate the health worker requirements for India's maternal and child health service guarantees in Orissa State. *Health Policy Plan.* 2012; 27 (1): 11-18.

Table 5.4: Economic and health indicators of BRICS countries, 1990 and 2010.

Indicator and source reference	Year	Country				
		Brazil	Russian Federation	India	China	South Africa
Economic indicators[13,14]						
GDP (1990-constant i$ per capita)	1990	4920.1	7778.7	1308.8	1870.9	3833.8
	2010	6728.8	9111.5	3298.9	7679.9	4789.4
Gini coefficient	1990	60.4	25.9	31.2	32.7	63.0
	2010	52.7	42.2	33.9	47.8	66.5
Mean years of education for individuals aged 25–34 years[15]						
Male	1990	5.9	11.6	5.9	7.3	7.6
	2009	8.3	13.2	8.1	9.3	10.2
Female	1990	6.2	11.6	2.9	5.7	7.4
	2009	9.3	13.8	5.6	8.9	10.4
Water and sanitation[16]						
Access to improved drinking water (%)	1990	88.5	93.2	70.3	66.7	82.6
	2010	96.9	97.0	90.7	91.5	91.4
Access to improved sanitation (%)	1990	66.8	73.8	17.7	23.7	63.9
	2010	80.3	70.4	34.2	64.8	73.8
Prevalence of open defecation (%)	1990	16.7	1.0	74.5	7.1	13.2
	2010	4.0	1.0	50.8	0.8	7.0
Demographics[17,18]						
Total population (thousands)	1990	149648	148149	868891	1165429	36793
	2010	195210	143618	1205625	1359821	51452
Rural population (%)	1990	26.1	26.6	74.5	73.6	48.0
	2010	15.7	26.3	69.1	50.8	38.5
Life expectancy at birth (years)	1990	66.7	67.6	58.7	69.5	61.8
	2010	73.2	67.6	65.7	74.9	55.2
Burden of disease[19]						
Communicable diseases (DALYs per 100000 inhabitants)	1990	10779.2	4521.2	31294.6	7897.2	16444.1
	2010	5077.1	4880.6	17365.6	2843.8	35202.9
Noncommunicable diseases (DALYs per 100000 inhabitants)	1990	22989.0	26144.4	27249.7	22358.9	25525.6
	2010	20125.0	25779.1	23356.3	17021.8	21897.3
Injuries (DALYs per 100000 inhabitants)	1990	4618.1	6585.4	5267.5	4371.5	5475.1
	2010	4014.2	6171.8	5137.8	2940.0	5011.5
Maternal, child and infant mortality[a,20]						
Maternal mortality (deaths per 100000 live births)	1990	120.0	74.0	600.0	120.0	250.0
	2010	56.0	34.0	200.0	37.0	300.0
Infant mortality (deaths per 1000 live births)	1990	48.8	23.0	81.0	38.7	48.2
	2010	15.0	10.3	48.6	13.7	35.5
Child mortality (deaths per 1000 live births)	1990	58.0	27.3	114.2	48.9	62.3
	2010	16.8	12.5	63.4	15.9	52.6

CHAPTER 6

NATIONAL HEALTH MISSION

NATIONAL HEALTH MISSION

Long standing need of urban health mission was accepted in 2013 by the Cabinet of the Government of India and rural and urban health mission merged to form National Health Mission in 12th Five Year Plan. The Vision of mission is :

"Attainment of Universal Access to Equitable, Affordable and Quality health care services, accountable and responsive to people's needs, with effective intersectoral convergent action to address the wider social determinants of health"

Goals: Outcomes for NHM in the 12th Plan are synonymous with those of the 12th Plan, and are part of the overall vision. The endeavor would be to ensure achievement of those indicators as given below:

1. Reduce MMR to 1/1000 live births
2. Reduce IMR to 25/1000 live births
3. Reduce TFR to 2.1
4. Prevention and reduction of anaemia in women aged 15–49 years
5. Prevent and reduce mortality & morbidity from communicable, non- communicable; injuries and emerging diseases
6. Reduce household out-of-pocket expenditure on total health care expenditure
7. Reduce annual incidence and mortality from Tuberculosis by half
8. Reduce prevalence of Leprosy to <1/10000 population and incidence to zero in all districts
9. Annual Malaria Incidence to be <1/1000
10. Less than 1 per cent microfilaria prevalence in all districts
11. Kala-azar Elimination by 2015, <1 case per 10000 population in all blocks.

Specific goals for the states will be based on existing levels, capacity and context. State specific innovations would be encouraged. Process and outcome indicators will be developed to reflect equity, quality, efficiency and responsiveness. Targets for communicable and non-communicable disease will be set at state level based on local epidemiological patterns and taking into account the financing available for each of these conditions.

Institutional Structures

Institutional structure have been approved by the Cabinet for NHM. At the National level, the Mission Steering Group (MSG) and the Empowered Programme Committee (EPC) are in place. The MSG provides policy direction to the Mission. The Union Minister of Health & Family Welfare chairs the MSG. The convenor is the Secretary, Department of Health & Family Welfare and the co-convenor is the Additional Secretary & Mission Director. The Mission is headed by a Mission Director, of the rank of Additional Secretary, supported by a team of Joint Secretaries. The Mission handles not just the day-to-day administrative affairs of the Mission but is responsible for planning, implementing and monitoring Mission activities.

The National Health Systems Resource Centre (NHSRC) would continue to serve as the apex body for technical support to the Centre and states. The National Institute of Health and Family Welfare (NIHFW) is the country's apex body for training and public health research and support to health and family welfare programs. Knowledge resources for the National Disease Control Programs are supported by the National Centre for Communicable Diseases. Additional knowledge resources can be harnessed from a number of emerging public health institutions, such as the public health divisions of centrally sponsored institutes namely, All India Institutes of Medical Sciences, (AIIMS) and Post Graduate Medical Education and Research, (PGIMER) others institutes and schools of public health in states.

At the state level, the Mission functions under the overall guidance of the State Health Mission (SHM) headed by the State Chief Minister and State Health Society (SHS) would be headed by the Chief Secretary. The District Health Mission (DHM)/City Health Mission (CHM) would be headed by Chair Person Zila Parishad/Mayor and District Health Society (DHS) headed by the District Collector. This would facilitate coordination with other related departments like Women & Child Development, Water Supply and Sanitation especially in times of response to disease outbreaks/ epidemics in the cities. Linkages with research institutes, schools of public health and medical colleges at State and National level would be supported.

Strengthening State Health Systems

The financing to the state under NHM will be based on the State's Program Implementation Plan (PIP). The PIP shall have following parts:

Part I : NRHM RCH Flexipool
Part II : NUHM Flexipool,
Part III : Flexible Pool for Communicable Diseases
Part IV : Flexible Pool for Non Communicable Diseases, Injury and Trauma
Part V : Infrastructure Maintenance

Within the broad national parameters and priorities, States would have the flexibility to plan and implement state specific action plans. All existing vertical programs shall be horizontally integrated at state, district and block levels. This will mean incorporation into an integrated state, district/city program implementation plan, sharing data and information across these structures.

Critical Areas for Concerted Action towards Health Systems Strengthening

1. Decentralized Health Planning

The District/City Health Action Plan will be developed as an instrument of progress towards the provision of universal health care in a phased manner. The District/ City Health Action Plan would outline the facility strengthening plan- essentially listing the facilities and defining the assured services each would provide and ensure that all essential health services are provided within the district. These plans would specify the current (baseline) package of services available in each facility, the inputs, activities and budget required to expand this package, improve the quality of care, expand access, and enable positive outcomes in service delivery for the following areas of service coverage: (1) Reproductive, Maternal, Newborn, Child Health and Adolescents (RMNCH+A), (2) Communicable Diseases, (3) Non Communicable diseases, and (4) Emergency Care Services.

The district/city health action plans will be prepared on the basis of a socio-epidemiological profile with a focus on the health needs of vulnerable groups (i.e. people living in difficult and remote hamlets, migrants, SC/ST and Primitive Tribal Groups, and other such populations including the poor, homeless, street children, construction and migrant workers, rag pickers, vendors, beggars, sex workers, etc.).

The district/city health action plan will be the platform for convergent local action and will integrate the common goals of related departments like Women and Child Development, School Education, Water and Sanitation, Housing and Urban Poverty Alleviation, Rural Development, Urban Development, and Environment for addressing the wider social determinants of health.

2. Facility Based Service Delivery

Facility Development Plan has the following components: Infrastructure, equipment, human resources, drugs and supplies, quality assurance systems and service provisioning. New construction would be planned not just on the basis of population

norms, but also consider other factors such as utilization of existing facility, existence of other facilities (public as well as private) and disease burden. The important principle of co-location of AYUSH services in health facilities would continue to be supported. Provision for supply of AYUSH drugs to support the human resource deployed would be made. Rogi Kalyan Samiti (RKS) would be strengthened to oversee governance and serve as an effective Grievance Redressal mechanism at the facility level.

3. The District Hospital and Knowledge Centre

The district hospital will to be strengthened to broadly serve the following roles which together define the District Hospital and Knowledge Centre (DHKC):

i. Provide all secondary and considerable elements of tertiary care required, so that most morbidities are managed within the district itself.

ii. Provide adequate referral support for clinical care at primary care levels.

iii. Serve as the preferred site for skill based in-service training.

iv. Function as the clinical site for a nursing school and college, for paramedical education programs, for a diploma/degree in public health, for a three year B.Sc. in community health, nursing and other similar programs.

v. Perform the function of resource support and serve as the institutional memory for district planning and data management and analysis.

vi. The DHKC would act as the knowledge support for clinical care in facilities below it, through a tele-medicine centre located in the district headquarters.

vii. Provide laboratory support for public health programs

A District Public Health Resource Centre would provide the technical inputs, support and handholding for planning, for epidemiology and data analysis, and for knowledge management, in a number of areas. The centre would preferably be staffed by Public Health Managers, Epidemiologists, Medical Entomologist, (optional), Microbiologist, Data Management and Analysis or Health Informatics specialists, Public health Administrator, and Hospital Manager.

A District Education and Training Centre would be developed in the district to provide preservice training for nurses - ANM, GNM and if feasible B.Sc (Nursing), courses for Allied Health Professionals, and potentially for a three year mid-level provider (B.Sc. community health) course.

4. Outreach Services

The existing provision of sub-centre workers could be continued with modifications in roles of existing workers and adding workers as necessary to undertake functions such as non-communicable diseases interventions or others. A mid-level worker with a B.Sc. qualification in public health or community health could also be included. In sub-centres that serve as delivery points and undertake deliveries regularly, additional ANMs can be added based on caseloads. The sub-centre would continue to receive its untied fund, with additional allocation of untied funds to sub-centres providing midwifery services, and/or handling larger caseloads. Mobile Medical Units (MMUs) to take health services to remote, far flung, difficult to reach areas and urban slums shall be supported

5. Community Processes, Behaviour Change Communication, and Addressing Social Determinants

The ASHA component would continue to be strengthened, while preserving the principles of voluntarism, local residency, community based selection, and the three key roles of facilitation for health care services, community level care provision including counselling and interpersonal communication for behaviour change, and social mobilization, especially for the marginalized to access essential health care services.

a. The Village, Health, Sanitation and Nutrition Committee (VHSNC)

The VHSNCs shall be supported to develop village health plans to - a) ensure convergent action on social determinants of health, b) ensure access to health services, especially of the more marginalized sections in the village, and c) support the organization of the Village Health and Nutrition Day

b. Behaviour Change Communication (BCC)

BCC programs will be based on systematic

identification of key behaviours an health care related practices and attitudes, which are detrimental to good health and those which promote good health, as well as analysis to understand the determinants of such behavior.

c. Addressing Social Determinants

At the district/city level, the level of malnutrition, outbreaks of water borne diseases, and the health of preschool and school children and out of school adolescents, are seen as important areas where convergent action is necessary and will be supporte to achieve desired outcomes. ASHAs, ANMs, and other frontline health workers will be trained in the critical areas of sanitation, safe drinking water, health and hygiene. This will also be an important component of the training curriculum for the Rashtriya Bal Swasthya Karyakram (RBSK) teams. In line with the ICDS restructuring, ASHA and the VHSNC/MAS will work with the AWW, in enabling the Sneha Shivirs, community forums to address malnutrition, and ensuring referral for examination by the Medical Officer.

Mainstreaming gender concerns shall be done by sensitizing providers and mid level managers to gender issues, and making facility level care women friendly, both as patients or care givers.

6. Social Protection Function of Public Health Services

Social protection from the rising cost of health care is a desirable and critical component of an effective health system. In order to achieve the NHM objectives, it is essential that good quality and safe medicines, diagnostics, and therapeutic procedures should be accessible, available and affordable to the beneficiaries. Access to free drugs is an important initiative under NHM in the 12th Plan. The route to ensuring free drug supply is to strengthen the capacity of the states in procurement, supply chain management and quality assurance, preferably through the establishment of a state level autonomous corporation/ body which is in charge not only of transparent and efficient procurement of drugs, but also of quality assurance and logistics, including efficient distribution systems down to the facility level. Making diagnostics free in the hospital, free diet to patients, assured free transport in the form of Emergency Response System (ERS) and Patient Transport Systems (PTS) would reduce the cost of healthcare.

7. Partnerships with the NGOs, Civil Society, and the for Profit Private Sector

NHM will encourage the public sector to contract-in or outsource those services which improve efficiency and quality of care in the public hospital. These services include the provision of diet, of emergency transport services, of housekeeping services, and diagnostic services. NGOs would be supported to mobilize additional technical capacity from a national canvas, where intra-district management and training capacity is overwhelmed by existing requirements in districts with limited capacity.

8. Human Resource Development

NHM shall also focus on creating/strengthening institutions for building capacity at state and sub-state and regional levels. NHM will support in-service programs, both residential and through distance education mode on family medicine, epidemiology, public health management and such other skills and specializations as needed. NHM will support development of a course for B.Sc in Community Health for mid-level clinical care provider. NHM envisages the use of telemedicine to support continuing medical and nursing education

9. Public Health Management

Managerial expertise is needed for public health services and clinical services, to enhance their outreach and effectiveness. While public health professionals should be provided training in managerial skills apart from public health related knowledge, a specialized Public Health Cadre would be needed to infuse managerial expertise into health services. There will be establishment and strengthening of state, district, city and block program management units.

10. Health of Tribals and People in Left Wing Extremist (LWE) affected areas

NHM would enable strategies to address the specific needs of tribals and people living in Left Wing Extremist (LWE) affected areas/districts. Such districts/areas would receive higher per capita resource allocations as appropriate. Health Care

services in tribal and LWE areas are adversely impacted by poor access and quality, scattered habitations, insufficient HR, and infrastructure

11. Pilots for Universal Health Coverage

Each state would be encouraged to undertake two to three pilot districts, if they are performing well against the existing program and fulfilling the mandatory conditionalities and preparatory activities for the UHC.

Three key preparatory activities are:

1. A good baseline measurement of the effective coverage/access to different services and the current out of pocket expenditure on health care.
2. A good quality district action plan
3. A health management information system linked to family health cards, which is able to support population-based health services for RCH and NCDs as well as support continuity of care across different levels of care.

12. Health Management Information Systems (HMIS)

NHM envisages a fully functional health information system facilitating smooth flow of information for effective decision-making. Multiple information systems in various health programs need to be integrated for seamless data exchange to enable comprehensive decision making

13. Governance and Accountability Framework

The NHM would have the following Framework for ensuring accountability:

- At the national level, the Mission Steering Group would continue to exercise the main program and governance oversight.
- At the state level, the State Health Mission and the Governing Body (GB) of the State Health Society and the District/City Health Society would serve as the primary mechanism of holding program executives accountable.
- The GB would meet annually, while the Executive Committee (EC) would meet at least thrice a year. Regular meetings of the GB and EC with adequate preparation, reports, transparency and multi-stakeholder participation are essential. The Society is also answerable through its Chairperson and Member Secretary to the Legislature and Parliament.
- The Statutory Audit report would mandatorily be placed before the GB of the SHS every Year.

Service Delivery Strategies

1. Reproductive, Maternal, Newborn, Child Health and Adolescent (RMNCH+A) Services

All schemes and programs that constituted RCH-II would be absorbed into the NHM. The NHM provides an opportunity to build on past work and renew the emphasis on strategies for improving maternal and child health through a continuum of care and the life cycle approach. All the aspects are embodied in the 'Strategic Approach to Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) in India'. The main strategies for RMNCH+A include services for mothers, newborns, children, adolescents and women and men in the reproductive age group.

2. Control of Communicable Diseases:

This will include National Vector Borne Diseases Control Program (NVBDCP), Revised National Tuberculosis Control Program (RNTCP), National Leprosy Control Program (NLEP) and Integrated Disease Surveillance Program (IDSP).

3. Non Communicable Diseases (NCD)

The schemes and interventions under the non communicable diseases that would be implemented upto the district hospital would be financed through a Flexible Pool for noncommunicable diseases under NHM. This will include National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS), National Program for the Control of Blindness (NPCB), National Mental Health Program (NMHP), National Program for the Healthcare of the Elderly (NPHCE), National Program for the Prevention and Control of Deafness (NPPCD), National Tobacco Control Program (NTCP), National Oral Health Program (NOHP), National Program for Palliative Care (NPPC), National Program for the Prevention and Management of Burn Injuries (NPPMBI) and National Program for Prevention and Control of Fluorosis (NPPCF)

Monitoring and Evaluation

There will be four major approaches to monitoring

and evaluation. They include: use of data from large scale population surveys, commissioning implementation research or evaluation studies, use of HMIS data and field appraisals and reviews. Health outcomes, output and process indicators will be monitored. The first will be through the using the periodic Population Health Surveys and Demographic Information. These include: The Sample Registration Surveys (SRS), Death statistics, National Sample Survey Organization (NSSO) data on cost of care and morbidity, DLHS and NFHS. The second will be through the commissioning of special studies. There will be a concurrent evaluation study and an end of the project impact evaluation study. Both studies will be designed by an expert group drawn from multiple organizations, which shall act as a steering and advisory committee for the study. The third is the use of data from the Health Management Information systems. This would be the most useful source of information for monitoring by district teams. The fourth approach would be through appraisal visits. Rapid appraisals by public health experts from varying types of organizations have added significant value to implementation. Most important of these is the Common Review Mission (CRM)

Financing of the National Health Mission

NHM would have six financing components, namely (i) NRHM/RCH Flexi-pool, (ii) NUHM Flexi-pool (iii) Flexible pool for Communicable Disease, (iv) Flexible pool for Non Communicable Disease including injury and trauma, (v) Infrastructure Maintenance and (vi) Family Welfare Central Sector Component.

Funding to states shall be based on the approved PIPs. The funds from the central government shall be given to the State Health Society in the manner as decided by the Central Government The NRHM RCH Flexipool would be utilized for Health systems strengthening including Infrastructure, Mobile Medical Units, Patient Transport Systems (for referral and emergency), procurement of equipment and drugs, AYUSH mainstreaming and drugs, support to ASHAs and VHSNC Maternal and Child Health interventions, Adolescent health interventions and Immunization NUHM Flexipool would be utilized to meet the health needs of urban population particularly the poor and vulnerable sections The Flexible Pool for Communicable Disease would be utilized for interventions under Communicable Disease Control Programs. The Flexible Pool for Non-Communicable Disease including Injury and Trauma would be utilized for interventions for non-communicable diseases including National Program for Prevention and Control of Cancer, Diabetes, Cardiovascular diseases and Stroke, National Mental Health Program, National Program for Control of Blindness and National Program for Health care of the Elderly.

Many initiatives (Patel V et al 2015) have been taken after the National Rural Health mission was launched:

Janani Suraksha Yojana: Launched in 2005, by modifying the existing National Maternity Benefit Scheme which improve the institutional deliveries contributing to the decline in maternal and child mortality.

- **Janani Shishu Suraksha Karyakram (JSSK):** Launched in June, 2011 which guaranteed comprehensive maternal and newborn health care in public health facilities and benefit 12 million women annually.

- **Rashtriya Bal Swasthya Karyakram (RBSK):** Launched in early 2013 targeting 270 million children younger than 18 years and aims to provide free diagnostic and early intervention services for disorders linked to nutrient deficiencies, birth defects, diseases common to children, and developmental delays, including disabilities.

- **Rashtriya Kishor Swasthya Karyakram (RKSK):** Launched in January, 2014, aimed to reach 253 million adolescents providing reproductive and sexual health, nutrition, injuries, violence, non-communicable diseases, mental health, and substance abuse.

- **National emergency response services:** A fleet of more than 15 000 emergency response service vehicles has been put in place.

- **Mobile Medical Units (MMUs):** More than 1200 specialised MMUs provide outreach for outpatient services including basic laboratory services.

- **Drugs and technology:** developed the mechanism

for free drugs and the availability of generic drugs, centralised drugs, and equipment procurement.

• **Health fi nancing and risk pooling:** The launch of many health insurance schemes like Rajiv Arogyasri in Andhra Pradesh, Mukhyamantri Amrutam Insurance Scheme in Gujarat, Yeshasvini Cooperative Farmers Health Insurance Scheme, and Vajpayee Aarogyashree Scheme in Karnataka, along with Rashtriya Swasthya Bima Yojana of the Ministry of Labour and Employment has contributed to poor people's increased access to specialised care, while also benefi ting the private sector substantially.

• **State and District Health Societies:** are formed to involve elected representatives, health-related departments, and other stakeholders in health care and to promote decentralisation.

• **Flexible fi nancing:** Integration of existing schemes and pooling of funds has led to activity-wise allocations based on the state health plans and the normative framework of the National Rural Health Mission.

• **Community Involvement:** forming Village Health Sanitation and Nutrition Committees, Patient Welfare Committees, and community monitoring mechanisms.

• **Program management:** units have been established in all states and districts to streamline implementation.

NATIONAL RURAL HEALTH MISSION

The National Rural Health Mission (NRHM) is a response to the verdict of the May 2004 general elections which led to the conceptualization of a set of pro-poor policies under the Common Minimum Program (CMP). Expenditure on health is always meager in amount as compare to other sectors. Public health expenditure has declined from 1.3% of GDP in 1990 to 0.9% of GDP in 1999. The Union Budgetary allocation for health is 1.3% while the State's budgetary allocation is 5.5%. Union Government contribution in public health expenditure is 15% while States contribution is 85%. Out of pocket expenditure on health is more for curative services in the country. There is little expenditure on preventive and promotive health. Vertical health and family welfare programs have limited synergisation at operational levels. For more details on integrated and vertical program please refer table 1.2. Lack of community ownership of public health programs affects the levels of efficiency, accountability and effectiveness. Rural population comprises more than 70% of the total Indians and has direct impact on health indicators. However the best health services and infrastructure are located in urban areas. Following were the differences between rural and urban areas before NRHM:

Infant Mortality Rate
Rural 62
Urban 39
Government beds
Rural 31.9%
Urban 68.1%
Beds per 1000 population
Rural 0.2 beds/1000 population
Urban 1.1 beds/1000 population
Graduate doctors distribution
Rural 28%
Urban 74%

There was shortfall of 8% doctors in Primary Health Centres (PHC), 65% for specialist at Community Health centres (CHC), 55.3% for health workers (male) and 12.6% for health workers (female).

This inequality existed for several decades and gap was widening continuously. There was an urgent need to take steps at the mission level. Following challenges were identified for public health in rural areas:

- Integration of sanitation, hygiene, nutrition and drinking water issues needed in the overall sectoral approach for health.
- Striking regional inequalities.
- The challenge of population stabilization especially in States with weak demographic indicators.
- Undue importance of curative services that favor non-poor.
- For every Re.1 spent on poorest 20% population, Rs.3 spent on the richest quintile.
- About 10% Indians had some form of health insurance, mostly inadequate.

Because of inequality of distribution of health in the country and various challenges the Union government on April 12, 2005 launched a National Rural Health Mission.

Preamble of National Rural Health Mission

- The National Rural Health Mission (NRHM) seeks to provide effective health care to the entire rural population in the country with special focus on 18 states, which have weak public health indicators.
- The Mission is an articulation of the commitment of the Government in National Health Policy to raise public spending on Health from 0.9% of GDP to 2-3% of GDP, over the next 5 years.
- It aims to undertake architectural correction of the health system to enable it to effectively handle increased allocations as promised under the National Common Minimum Program.
- It has as its key components provision of a health activist in each village; a village health plan prepared through a local team headed by the panchayat representative; strengthening of the rural hospital for effective curative care and made measurable through Indian Public Health Standards (IPHS), and accountable to the community; and integration of vertical health & family welfare programs and Funds for optimal utilization of funds and infrastructure and strengthening delivery of primary healthcare.
- It aims at effective integration of health concerns with determinants of health like sanitation, hygiene, nutrition, and safe drinking water through a district plan for health.
- It seeks decentralization of the health programs for district management of health.
- It seeks to address the intrastate and inter-district disparities, especially among the 18 high focus States, including unmet needs for public health infrastructure.
- It aims to promote policies that strengthen public health management and services in the country.
- It shall define time-bound goals and report publicly on their progress.
- Above all, it seeks to improve access of rural people, especially poor women and children, to equitable, affordable, accountable and effective primary healthcare.

Guiding Principles

- Promote equity, efficiency, quality and accountability in Public Health Systems.
- Enhance People orientation and community-based approaches.
- Ensure Public Health Focus.
- Recognize value of traditional knowledge base of communities.
- Promote new innovations, method and process development.
- Decentralize and involve local bodies.

Goals of NRHM

The Mission is expected to achieve the goals (Figure 6.1) set under the National Health Policy and the Millennium Development Goals (MDGs).

- Reduction in Infant Mortality Rate and Maternal Mortality Ratio *by 50% from existing levels in next 7 years.*
- Universal access to public services for food and nutrition, sanitation and hygiene and universal access to public health care services with emphasis on services addressing women's and children's health and universal immunization.
- Prevention and control of communicable and noncommunicable diseases, including locally endemic diseases.
- Access to Integrated comprehensive primary healthcare.
- Population stabilization, gender and demographic balance.
- Revitalize local health traditions and mainstreaming AYUSH.
- Promotion of healthy life styles.

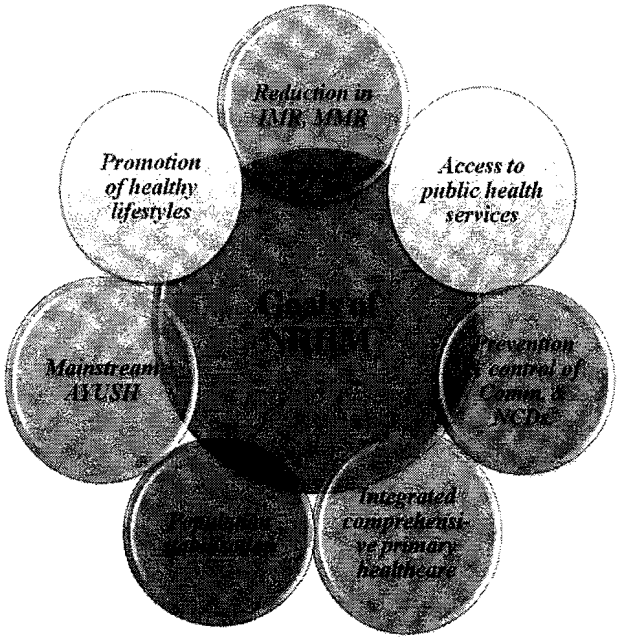


Figure 6.1: Goals of NRHM

Objectives

- *ASHA:* Provision of trained and supported Village Health Activist in underserved areas as per need (Accredited Social Health Activists, ASHA) – Ensuring quality and close supervision of ASHA.
- *Health Action Plan:* Preparation of health action plans by panchayats as mechanism for involving community in health.
- *IPHS:* Strengthening SC/PHC/CHC by developing Indian Public Health Standards.
- *FRU:* Increase utilization of First Referral Units from less than 20% (2002) to more than 75% by 2010.
- *District:* Institutionalizing and substantially strengthening District level Management of Health (all districts).
- *AYUSH:* Strengthening sound local health traditions and local resource based health practices related to PHC and public health.

Expected Outcomes from the Mission

- IMR reduced to 30/1000 live births by 2012
- MMR reduced to 100/100,000 live births by 2012.
- TFR reduced to 2.1 by 2012.
- Malaria mortality reduction rate-50% by 2010, additional 10% by 2012.
- Kala-Azar mortality reduction rate-100% by 2010 and sustaining elimination until 2012.
- Filaria reduction rate-70% by 2010, 80% by 2012 and elimination by 2015.
- Dengue mortality reduction rate-50% by 2010 and sustaining it at that level till 2012.
- Japanese encephalitis mortality reduction rate-50% by 2010 and sustaining it at the level till 2012.
- Cataract operations increasing to 46 lakh per annum until 2012.
- Leprosy Prevalence Rate- reduce from 1.8 per 10,000 in 2005 to less than one per 10000 thereafter.
- TB DOTS series – maintain 85% cure rate through entire mission period.
- Upgrading all CHCs to Indian Public Health Standards.
- Increase utilization of First Referral Unit from bed occupancy by referred cases of less than 20% to over 75%.

Core Strategies

- Train and enhance capacity of PRIs to own, control and manage public health services.
- Promote access to healthcare to household through the female health activist known as Accredited Social Health Activist (ASHA).
- Health Plan for each village through Village Health Samiti of the Panchayat.
- Strengthening sub-center through an untied fund to enable local planning and action and training for MPWs.
- Strengthening existing PHCs and CHCs, and provision of 30-50 bedded CHC per lac population for improved curative care to a normative standard (Indian Public Health Standards defining personnel, equipment and management standards).
- Preparation and Implementation of an inter-sectoral District Health Plan prepared by the District Health Mission, including drinking water, sanitation and hygiene, and nutrition.
- Integrating relevant vertical health and family welfare programs at national, state and district levels.
- Technical support to national, state and district health missions, for public health management.
- Strengthening capacities for data collection assessment and review for evidence based planning – monitoring and supervision.
- Ensure formulation of transparent policies for deployment and career development of human resources for health.
- Developing capacities for preventive and promoting health care at all levels – such as healthy life styles, reduction in consumption of tobacco and alcohol, etc.
- Promoting nonprofit sector particularly in underserved areas.
- Communication strategy is aimed to facilitate awareness, dissemination of information regarding availability of and access to quality health care by the poor, women and children in rural areas. The core objectives of the strategy is to encourage health seeking behavior.

Supplementary Strategies

- Regulation of private sector, including the informal rural practitioners, to ensure availability of quality service to citizens at reasonable cost.
- Promotion of Public Private Partnerships for achieving public health goals.
- Mainstreaming AYUSH – revitalizing local health traditions.

- Reorienting medical education to support rural health issues including regulation of medical care and medical ethics.
- Effective and viable risk pooling and social health insurance to provide health security to the poor by ensuring accessible, affordable, accountable and good quality hospital care.

PLAN OF ACTION

Component 1: Accredited Social Health Activists (ASHA)

- *Selection:* Every village/large habitat (1000 population) should have a female community health activist-chosen by and accountable to the *panchayat*- to act as the interface between the community and the public healthcare system. ASHA must be primarily a woman resident of the village-married/widow/divorced and preferably in the age group of 25-45 yrs. She should be a literate woman with formal education up to 8th class with communication and leadership qualities.
- These Accredited Social Health Activists (ASHAs) are trained on a pedagogy of public health, developed and monitored through a national experts group incorporating best practices and implemented through active involvement of community health resource organizations.
- *Training:* Various models of training are used:
  - Contact plus distance learning model.
  - NGO/private partnership.
  - ICDS training centers and state health institutes
  - Comprehensive women's health & empowerment model.
  - Effective NGO models.
  - Selected by village panchayat under the supervision and guidance of block medical officer.
  - Recieve induction training of 23 days over one year and then periodic re-training.
- ASHA acts as a bridge between the ANM and the village and be accountable to the *panchayat.*
- ASHA is honorary volunteer. She receives performance based incentives for promoting construction of household toilets, universal immunization, referral and escort services for RCH, and other healthcare delivery programs.
- ASHA makes the village health plan along with anganwadi worker, community workers and ANM under the leadership of the *panchayat health samiti.*
- *Responsibilities*:

(a) Awareness: To create awareness and provide information to the community on determinants of health such as nutrition, basic sanitation and hygienic practices, healthy living and working conditions, information on existing health services and need for utilization of health & family welfare services;

(b) Counseling: to counsel women on birth preparedness, importance of safe delivery, breast feeding and complementary feeding, immunization, contraception and prevention of common infections including RTIs/STIs and care of the young child;

(c) Mobilization: to mobilize the community and facilitate them in accessing health and health related services available at the Anganwadi/ subcenter/PHCs, such as immunization, ANC, PNC, supplementary nutrition, sanitation and other services being provided by the government;

(d) Work with VHSC: to work with the village health and sanitation committee of the *gram panchayat*;

(e) Escort: to arrange escort/accompany pregnant women and children requiring treatment/admission to the nearest pre-identified health facility;

(f) Medical Care: to provide primary medical care for minor ailments such as diarrhea, fever, and first aid. She will be a provider of DOTS also;

(g) Drug Depot: to act as depot holder for essential provisions being made available to every habitation like ORS, Iron & Folic Acid tablets, Disposable Delivery Kit, Oral pills, condoms, etc.;

(h) Birth & Death Registration: to inform sub-center/ PHC about birth & death; and

(i) Sanitation: to promote construction of household toilets under total sanitation campaign.

- She is provided a drug kit.
- ASHA is promoted all over the country, with special emphasis on the 18 high focus states and low performing districts. Government of India bears the cost of training, incentives and medical kits. Rest to be funded under financial envelope.

Component 2: Strengthening Sub-Centers

- Each sub-center is having an untied fund for local

action @ Rs. 10,000 per annum. This fund is held in joint account of ANM and Panchayat Sarpanch.
- Supply of essential drugs (allopathic and AYUSH) to the subcenters.
- In case of additional outlays, MPWs (Male)/ additional ANMs wherever needed, sanction of new subcenters as per 2001 population norm, and upgrading existing subcenters, including buildings for subcenters functioning in rented premises is be considered.

Component 3: Strengthening Primary Health Centers

- Strengthening of PHC for quality preventive, promotive, curative, supervisory and outreach services.
- Adequate and regular supply of essential quality drugs and equipment to PHCs.
- Provision of 24 hour services in 50% PHCs by addressing shortage of doctors, especially in high focus states, through mainstreaming AYUSH manpower.
- Standard treatment guideline & protocols.
- Supply of Auto Disabled (AD) Syringes for immunization.
- In case of additional outlays, intensification of ongoing communicable disease control programs, new programs for control of noncommunicable diseases, upgradation of 100% PHCs, and provision of 2nd doctor at PHC level (1 male, 1 female) would be undertaken on the basis of felt need.

Component 4: Strengthening CHCs for First Referral Care

- Operationalizing existing Community Health Centers (30-50 beds) as 24 hour First Referral Units, including posting of anesthetists.
- Codification of new Indian Public Health Standards (IPHS), setting norms for infrastructure, staff, equipment, management etc. for SC/PHC/CHC.
- Promotion of stakeholders' committees (Rogi Kalyan Samitis) for hospital management.
- Developing standards of services and costs in hospital care.
- In case of additional outlays, creation of new Community Health Centers (30-50 beds) to meet the norm of one per 100,000 population, and bearing their recurring costs for the mission period could be considered.

Component 5: Planning under NRHM: District Health Plan

- District Health Plans are to be prepared by an aggregation and consolidation of Village Health Plans. Block Plans will be the basis for the district plan.
- This requires setting up of planning teams and committees at various levels-habitation/village, *Gram Panchayat* (SHC), PHC (Cluster level), CHC/Block level, District level. At village, PHC and block levels, broadly representative committees would perform both planning and ongoing monitoring functions. A similar committee at district level would be involved in reviewing plans, based on drafting by the specialized district planning team. The monitoring and planning committee at state level would be supported by a state health-planning cell a similar cell being required at the state and national level to provide support as needed.
- Besides large scale consultations, planning teams have to conduct household surveys, help select ASHAs, organize training for community groups and health functionaries. NGOs have a role in the entire planning process.
- Orientation of planning team and contractual engagement of professionals as per need has to be the starting point for the planning process.
- Village health plans are likely to take time and therefore district, block and cluster level consultation may have to form the basis for initial district plans. The initial plans could be adhoc and for a year. The perspective plan must be in the basis of village health plan. Even then, block will be the key level for development of decentralized plans.
- Concept of "funneling" to district for effective integration.
- All parallel bodies in health at district and state level merge into one common " District Health Mission" at the district level and the " State Health Mission" at the state level.
- Project Management Unit for all districts run through contractual engagement of MBA, Chartered Accountants, and data entry operator for improved program management.

Levels of planning and the key functionaries

- Village level health and sanitation committee is responsible for the village health plans. ASHA, the Anganwadi Sevika, the *Panchayat* representative, the Self Health Group (SHG) leader and local community based organization (CBO) representatives are be key persons responsible for the household survey, the village health register and the village health plan.
- The *gram panchayat* level health plans, comprising a group of villages in many states and a single village in a few, are worked on at the sub-health centre level. The *gram panchayat pradhan*, the ANM, the MPW, a few village health & sanitation committee representatives are responsible for the gram panchayat health plan. They are also be responsible for overview and support for the household survey, preparation of village health registers and preparation of village health plans-the gram panchayat /SHC level would also organize activities like health camps to facilitate the planning process.
- The cluster level is led by the PHC/additional PHC. Ordinarily there are 1-4 Clusters in a block. The PHC health monitoring and planning committee will facilitate planning inputs of panchayat representatives, along with other inputs from the community to formulate a broad plan. In this context the medical officer in-charge of PHC will work in close coordination with the *pradhans* of the *gram panchayats* covered in that cluster. The cluster level would be responsible for over viewing the work of *gram panchayats* and for organizing surveys and activities through the SHCs.
- The block/CHC level monitoring and planning committee will review the block health plan. The president of the block panchayat samiti, the block medical officer, the block development officer, NGO/CBO representative, head of the CHC level *rogi kalyan samiti* will be key members of this team. Additional social mobilization professionals and planning resource persons will also be contracted at the block level to develop a good resource team. The Block Health Mission Team will finalize the block health plans. The block health teams would also supervise household and health facility survey. They would also organize public hearings and health camps in order to make the planning process activity intensive.
- The district level Heath Mission will have a health monitoring and planning committee responsible for providing overall guidance and support to the planning process. A draft plan will be formulated by the district health team, and presented for discussion to the broader committee. After relevant discussion and modifications in the committee, the district plan will be finally streamlined by the district health team which, besides a few existing government functionaries, will also have NGO representatives and a few professionals specially recruited to meet planning and implementation needs. The district planning team will be responsible for household surveys and health facility surveys. They would also facilitate organization of health camps and public hearings in order to make the planning process activity intensive. The president of Zila Parishad, the district medical officer, the district magistrate will be key functionaries of the district team. Every district health society would be assisted by a technical support agency, which they can choose from a number of options.
- The state level Health Mission is having a state health monitoring and planning committee to give overall guidance to the planning process. The state resource center/planning cell proposes the draft plans to the committee. After relevant discussion, the state resource centre/ planning cell is finally streamline the plans as part of its resource support.
- The Resource Support: The resource centre/ planning cell have to supervise the work of all the district health missions by scrutinizing and providing feedback on the plans so that adequate quality of plans and processes are ensured. The State Resource Center also finalizes survey formats of plans at various levels. It also finalizes with guidance and directives from the ministry, the criteria for prioritization and indication of resources likely to be available for each block and convey to the district these details as it also helps developing the financial norms in conformity with these guidelines and on the basis of inputs from blocks and district.

Component 6: Converging Sanitation and Hygiene under NRHM

- The Total Sanitation Campaign (TSC) is to be implemented in all the districts.

- Components of TSC include IEC activities, rural sanitary marts, individual household toilets, women sanitary complex, and School Sanitation Program.
- The TSC is implemented through PRIs.
- NRHM proposes district and subdistrict arrangements for Rural Sanitation Program similar to the DHM. The DHM would guide activities of sanitation at district level.
- The DHM promotes joint IEC for public health, sanitation and hygiene, through village health & sanitation committee, and promote household toilets and school sanitation program. ASHA would be given incentive for promoting household toilets by the mission.
- The additional of Rs.4000 crores over next 5 years for TSC would be advocated by the NRHM.

Component 7: Strengthening Disease Control Programs

- Strengthening ongoing National Disease Control Programs for Malaria, TB, Kala Azar, Filaria, Blindness & Iodine Deficiency is horizontally integrated under the mission, for improved program delivery.
- New initiatives would be launched for control of Non communicable diseases.
- Strengthening disease surveillance system at village level.
- Supply of generic drugs (both Allopathic & AYUSH) for common ailments at village, SC, PHC/CHC level.

Component 8: Public-Private Partnership (PPP) for public health goals, including regulation of private sector

- More than 75% of health services are being provided by the private sector, there is a need to refine regulation.
- Regulation to be transparent and accountable.
- Reform of regulatory bodies/creation where necessary.
- District Institutional Mechanism for Mission must have representation of private sector.
- Need to develop guidelines for Public Private Partnership for health sector.
- Lead role of public sector in defining the framework and sustaining the partnership.
- Management plan for PPP initiatives: at district/ state and national levels.
- Identifying areas of partnership which are need based, thematic and geographic.
- Task Force to improve details/guidelines.

Achievements and examples:

1. Chiranjeevi Scheme of Gujarat to involve private sector gynaecologists for delivery of BPL women
2. Franchising as per agreed standards & costs as attempted by Surya Clinic in Bihar.
3. Yeshasvini Trust Health Insurance partnerships in Karnataka for standard surgeries at agreed costs.
4. Initiative of Govt of WB in partnerships with private sector for mobile health clinics.
5. MAMTA scheme in Delhi.
6. Emergency medical relief program in AP.

Component 9: New Health Financing Mechanisms

- Task Force to examine new health financing mechanisms, including risk pooling for hospital care as follows:
- Progressively the district health missions to move towards paying hospitals for services by way of reimbursement, on the principle of *"money follows the patient."*
- Standardization of services – outpatient, inpatient, laboratory, surgical interventions- and costs will be done periodically by a committee of experts in each state.
- A national expert group to monitor these standards and give suitable advise and guidance on protocols and cost comparisons.
- All existing CHCs to have wage component paid on monthly basis. Other recurrent costs may be reimbursed for services rendered from district health fund. Over the mission period, the CHC may move towards all costs, including wages reimbursed for services rendered.
- A district health accounting system, and an ombudsman to be created to monitor the district health fund management, and take corrective action.
- Adequate technical managerial and accounting support to be provided to DHM in managing risk-pooling and health security.
- Where credible Community Based Health Insurance Schemes (CBHI) exist/are launched, they will be encouraged as part of the mission.

- The central government will provide subsidies to cover a part of the premiums for the poor, and monitor the schemes.
- The IRDA is approached to promote such CBHIs which is periodically evaluated for effective delivery.

Component 10: Reorienting Health/Medical Education to Support Rural Health Issues

- While district and tertiary hospitals are necessarily located in urban centers, they form an integral part of the referral care chain serving the needs of the rural people.
- Medical and paramedical education facilities need to be created in states, based on need assessment.
- Suggestion for Commission for Excellence in Health Care (Medical Grants Commission), National Institution for Public Health Management, etc.
- Need for mainstreaming AYUSH.
- Task Force to improve guidelines/details.

Institutional Mechanism (I)

- Village Health & Sanitation Samiti (at village level consisting of Panchayat Representatives, ANM/ MPW, Anganwadi worker, teacher, ASHA, community health volunteers).

Role of Village Health Committee Activities

- Create public awareness about the essentials of health programs.
- Discuss and develop a village health plan based on an assessment of the village situation and priorities identified by the village community.
- Analyze key issues and problems related to village level health and nutrition activities, give feedback on these to relevant functionaries and officials. Present annual health report of the village in the *Gram Sabha.*
- Participatory Rapid Assessment: to ascertain the major health problems and health related issues in the village. Estimation of the annual expenditure incurred for management of all the morbidities may also be done. The mapping will also take into account the health resources and the unhealthy influences within village boundaries.
- Maintenance of a village health register and health information board/calendar: The health register and board put up at the most frequented section of the village will have information about mandated services, along with services actually rendered to all pregnant women, new born and infants, people suffering from chronic diseases etc.
- Ensure that the ANM and MPW visit the village on the fixed days and perform the stipulated activity; oversee the work of village health and nutrition functionaries like ANM, MPW and AWW.
- Get a bimonthly health delivery report from health service providers during their visit to the village.
- Take into consideration the problems of the community and the health and nutrition care providers and suggest mechanisms to solve it.
- Discuss every maternal death or neonatal death that occurs in their village, analyze it and suggest necessary action to prevent such deaths. Get these deaths registered in the *panchayat.*
- Managing the village health fund.

- Rogi Kalyan Samiti (or equivalent) for community management of public hospitals.
- District Health Mission (under the leadership of Zila Parishad with District Health Head as Convener and all relevant departments, NGOs, private professionals etc. represented on it).
- State Health Mission (Chaired by Chief Minister and cochaired by Health Minister and with the State Health Secretary as Convener-representation of related departments, NGOs, private professionals etc.).

Institutional Mechanism (II)

- Integration of Departments of Health and Family Welfare, Government of India.
- National Mission Steering Group chaired by Health & Family Welfare Minister with Dy. Chairman Planning Commission, Ministers of Panchayat Raj, Rural Development and Human Resource Development and public health professionals (nominated by HFWM in consultation with PM). Secretary HFW as Convener.
- Empowered Program Committee chaired by Secretary HFW.
- Standing monitoring group for ASHA.
- Task Forces for selected tasks (time-bound).

Technical Support

- To be effective the mission needs a strong component of technical support
- To include reorientation into public health management
- Reposition existing health resource institutions
- Involve NGOs as resource organizations
- Improved health information system
- Support required mostly at district and below district level. Also at state and national level
- Technical support national level and state level public health institutions need to be created in government, non government and private sector
- Program Management Support (using contracting mechanisms)

A. Program Management support center: For Strengthening management systems-basic program management, financial systems, infrastructure maintenance, procurement systems, MIS etc.

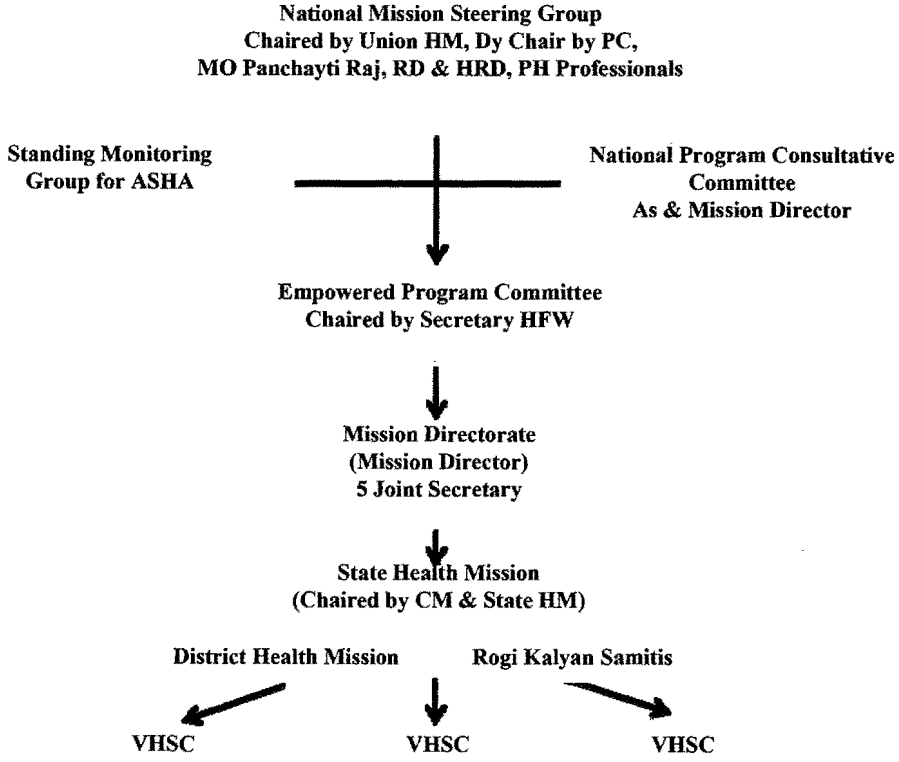
- For Developing Manpower Systems – recruitment (induction of MBAs/CAs/ MCAs), training & curriculum development (revitalization of existing institutions & partnerships with NGO & PVT. Sector institutions), motivation & performance appraisal etc.
- For improved governance – decentralization & empowerment at cutting edge level, induction of IT based systems, creation of a non-lapsable health pool, flexibility, partnership programs.

B. Health Trust of India

- For Development of Knowledge Systems – research & documentation, health information system, planning, monitoring & evaluation etc.
- For establishing public accountability systems – external evaluations, community based feedback mechanisms, participation of PRIs /NGOs etc.
- For developing a framework for pro-poor innovations.
- For reviewing health legislations.
- For inter & intra sector networking.
- Think tank for developing a long-term vision of the sector & for building planning capacities of PRIs, districts etc.

Strategy for North East States

- Empowerment to the Mission would mean greater flexibilities for the 10% committed outlay of the M/o Health & FW, for North East States.



- It should be possible to create new health infrastructure, mobility, and increased technical support for the program.
- States to project specific interventions under the Mission, including ASHAs and role of PRIs, in their action plans.
- Opportunity to address local health issues in a comprehensive manner.

Role of State Governments under NRHM

- The mission covers the entire country. The 18 high focus States are Uttar Pradesh, Bihar, Rajasthan, Madhya Pradesh, Orissa, Uttaranchal, Jharkhand, Chhattisgarh, Assam, Sikkim, Arunachal Pradesh, Manipur, Meghalaya, Tripura, Nagaland, Mizoram Himachal Pradesh and Jammu & Kashmir. GoI would provide funding for key components in these 18 high focus states. Other states would fund some interventions like ASHA, PMU, up gradation of SC/PHC/CHC through integrated finance envelope.
- NRHM provides broad conceptual framework. states would project operational modalities in their state action plans, to be decided in consultation with the national mission steering group.
- NRHM would prioritize funding for addressing interstate and intra-district disparities in terms of health infrastructure and indicators.

Role of PRIs

- A task force looks at the process of making panchayats central to the implementation of NRHM accordance with their mandated functions.
- The mission envisages the following roles for PRIs:
  - ASHAs are selected by and accountable to the village panchayat.
  - The village health committee prepares the village health plan, and promote intersectoral integration.
  - The untied fund at Subcenters is deposited in a Bank Account, jointly operated by ANM and *sarpanch*. District Health Mission to be led by the Zila Parishad. The DHM also guides activities of sanitation.
  - The DHM controls, guide and manage all public health institutions in the district, Subcenters, PHCs and CHCs.
  - PRIs involvement in Rogi Kalyan Samitis for good hospital management.
  - Training to members of PRIs.
  - Making available health related databases to all stakeholders, including panchayats at all levels.
  - States to indicate in their MoUs their commitment for devolution of funds and programs to PRIs.

Role of NGOs for the Mission

Role of the NGOs for the Mission is as envisaged is as follows:

- In institutional arrangements,
- Standing Monitoring Group for ASHA,
- Member of Task Forces,
- Provision of Training, BCC and Technical Support for ASHAs/DHM,
- Health Resource Organizations,
- Service delivery for identified population groups on select themes.
- For monitoring, evaluation, and social audit.

Mainstreaming AYUSH

Ayush is playing a significant role in delivering health services in rural areas. Many people have faith in Indian system of medicine and should be utilized for the delivery of preventive and promotive health services through them. They can deliver RCH services, DOTS, MDT, and AIDS awareness program so they should be trained to do so.

Funding for the Mission

- Funds are fully available within the outlay of the M/o Health & FW for undertaking specific mission components.
- There is an indication of likely enhancement of the current availability of budget for the ministry, in keeping with the NCMH mandate of increased allocation for public health expenditure.
- The Mission's activities for each year shall be decided in consultation with the Planning Commission.
- Monitoring and Evaluation.
- Health MIS to be developed and web-enabled for citizen scrutiny.
- Annual district reports on people's health (to be prepared by Govt./NGO collaboration).
- State and national reports on people's health to be tabled in assemblies, and parliament.
- Subcenters to report on performance to

panchayats, hospitals to *Rogi Kalyan Samitis* and district health mission to *zila parishad.*

- External evaluation through professional bodies/ NGOs.

New Initiatives in IEC

- Branding of NRHM through multi-mediatools (logo, visual, message, audio video spots).
- Launch of the NRHM newsletter. Special issues on maternal mortality and immunization published.
- Theme based campaign-immunization week in Jan., Feb., and March 2006, breast feeding, institutional delivery, "save the girl child", iodized salt, Janani Suraksha Yojana, profiling of ASHA role and responsibilities, convergence of health workers-AWW, ASHA and ANM.
- Integration of IEC on AIDS, RCH, etc.
- Innovative IEC (use of postal stationery, use of NRHM health messages in official stationery, NHRM messages in prescription slips used at PHC, CHC in states, in melas, calendar, etc.
- Goodwill Ambassador on Save the girl child campaign
- Placement of spots in private satellite channels, Doordarshan, FM channels, etc.

INDIAN PUBLIC HEALTH STANDARDS

Community Health Centers

Health care delivery in India has been envisaged at three levels namely primary, secondary and tertiary. The secondary level of health care essentially includes Community Health Centers (CHCs), constituting the First Referral Units (FRUs) and the district hospitals. The CHCs were designed to provide referral health care for cases from the primary level and for cases in need of specialist care approaching the centre directly. 4 PHCs are included under each CHC thus catering to approximately 80,000 population in tribal / hilly areas and 1, 20,000 population in plain areas. CHC is a 30-bedded hospital providing specialist care in medicine, Obstetrics and Gynecology, Surgery and Pediatrics. These centers are however fulfilling the tasks entrusted to them only to a limited extent. The launch of the National Rural Health Mission (NRHM) gives us the opportunity to have a fresh look at their functioning. NRHM envisages bringing up the CHC services to the level of Indian Public Health Standards.

Although there are already existing standards as prescribed by the Bureau of Indian Standards for 30-bedded hospital, these are at present not achievable as they are very resource-intensive. Under the NRHM, the Accredited Social Health Activist (ASHA) is being envisaged in each village to promote the health activities. With ASHA in place, there is bound to be a groundswell of demands for health services and the system needs to be geared to face the challenge. Not only does the system require upgradation to handle higher patient load, but emphasis also needs to be given to quality aspects to increase the level of patient satisfaction. In order to ensure quality of services, the Indian Public Health Standards are being set up for CHCs so as to provide a yardstick to measure the services being provided there.

There are 4276 CHCs functioning in the country as per Rural Health Statistics Bulletin published in July, 2009.

Service Delivery

- All Essential (Minimum Assured Services) as envisaged in the CHC should be available, which includes routine and emergency care in Surgery, Medicine, Obstetrics and Gynecology, Pediatrics, Dental and AYUSH in addition to all the National Health Programs.
- States/UTs must also aspire to achieve the ideal levels which have been indicated as 'Desirable'.
- Appropriate Guidelines for each National Program for Management of routine and emergency cases are being provided to the CHC.
- All the support services to fulfill the above objectives will be strengthened at the CHC level.

Minimum requirement for delivery of the above-mentioned services

The following requirements are being projected based on the assumption that there will be average bed occupancy of 60%. The strength may be further increased if the occupancy increases with subsequent up gradation. As regards Manpower, 2 specialists, namely, Anesthetist and Public Health Program Manager will be provided on contractual basis in addition to the available specialists, namely, Surgery, Medicine, Obstetrics and Gynecology and Pediatrics.

The support manpower will include a Public Health Nurse, ANM, Dental Assistant and Cold Chain and

Vaccine Logistic Assistant in addition to the existing staff. An Ophthalmic Assistant will also need to be provided in centers where currently there is none. One Ophthalmologist (MS or Diploma in Ophthalmology) for every 5 CHCs is recommended in addition to existing Provisions. One Dental Surgeon, 6 GDMOS, one AYUSH specialist and one AYUSH general doctor are also recommended in this IPHS.

Facilities

The equipment provided under the Child Survival and Safe Motherhood Program (CSSM) is deemed adequate. Physical Infrastructure is remodeled or rearranged to make best possible use for optimal utilization. New Constructions followed the specifications provided in this document. Space requirements for different functional areas have been listed out.

Human Resource Management

Capacity Building is ensured at all levels by periodic training of all cadres.

Accountability

It is mandatory for every CHC to have "Rogi Kalyan Samiti" (RKS) to ensure accountability. Every CHC shall have the Charter of Patients' Rights displayed prominently at the entrance. A grievance redressal mechanism under the overall supervision of RKS would also be set up.

Quality of services

Every CHC shall also have the Standard Operating Procedures and Standard Treatment Protocols for common ailments and the National Health Programs. Social audit by involvement of the community through RKS is being recommended. To maintain quality of services, external monitoring through Panchayati Raj Institutions and internal monitoring at appropriate intervals will be advocated. Guidelines are being provided for management of routine and emergency cases under the National Health Programs so as to maintain uniformity in Management in tune with the National Policy.

Modifications recommended under revised draft 2010 are as follows:

I. Services: Standards of existing services under programs were updated based on the inputs from various program divisions.

i. New born stabilization unit added.
ii. MTP facilities for second trimester pregnancy (desirable)
iii. The Integrated Counseling and Testing Centre (ICTC), Blood storage, link Anti Retroviral Therapy centre added

II. Standards added for following newly developed (non communicable) disease programs.

i. National Program for prevention and control of deafness.
ii. National Mental Health Program.
iii. National Cancer control program.
iv. National program for prevention and control of Diabetes, Cardio Vascular Disease, and Strokes.
v. National Iodine deficiency Disorders control program

Personnel	Essential	Desirable
Staff Nurse	15@	+3
Lady Health Visitor		1
Public Health Nurse (PHN)	1	
ANM	1	
Pharmacist/compounder	3	
Pharmacist – AYUSH	1	
Lab. Technician	3	
Radiographer	2	
Dietician		1
Ophthalmic Assistant	1	
Dental Assistant	1	
Cold Chain & Vaccine Logistic Assistant	1	
Dresser (certified by Red Cross/ St. Johns Ambulance)	2	
Ward Boys / Nursing Orderly	5	
Sweepers*	5	
Chowkidar*	5	
Dhobi*	1	
Mali*	1	
Aya*	5	
Peon*	2	
OPD Attendant*	1	
Registration Clerk	2	
Statistical Assistant/Data Entry Operator	2	
Trained cooks as per hospital dietary recommendations	2	
Account / Admin Assistant	1	
OT Techinician	1	
Multi-Rehabilitation Worker / Community Based Rehabilation worker	1	+1
Counseller		1
Driver*		3
Total	65	75

* outsourced

@for providing round the clock service at OT, Labour Room & casualty, male ward and female ward along with provision of leave reserve.

Note: One of the Class IV employees can be identified as a helper to Cold Chain & Vaccine Logistic Assistant and trained as Cold Chain Handler

vi. National program for prevention and control of Fluorosis: in-affected Districts
vii. National Tobacco Control program
viii. National program for health care of Elderly
ix. Oral Health
x. Physical medicine and rehabilitation services.

III. Infrastructure:
i. Signage.
ii. Barrier free access.
iii. Disaster prevention measures (desirable for new upcoming facilities),
iv. Residential quarter for the staff.
v. Functions and space requirements are updated.

IV. Manpower: the new IPHS recommends the changes in manpower at CHC
i. Part time cancer surgeon / physician (under Public Private Partnership mode) is desirable.
ii. One lady health visitor (desirable)
iii. One dietician (desirable)
iv. One dental assistant.
v. One cold chain and vaccine logistic assistant
vi. Multi rehabilitation worker / community based rehabilitation worker (one essential and one desirable)
vii. One counselor (desirable)
viii. Three drivers for the facility vehicles. (out sourced)

V. Drugs: the list of *essential drugs* updated; the drug list for *obstetric care* and sick newborn & child care (for First Referral Unit (FRU) / CHC) incorporated in these guidelines.

VI. Equipment: List updated.

VII. Reporting format under Integrated Disease Surveillance Project included.

VIII. Facility based MDR (Maternal Death Review)

Primary Health Centers

Primary Health Centers are the cornerstone of rural health services- a first port of call to a qualified doctor of the public sector in rural areas for the sick and those who directly report or referred from Sub-centers for curative, preventive and promotive health care. A typical Primary Health Centre covers a population of 20,000 in hilly, tribal, or difficult areas and 30,000 populations in plain areas with 6 indoor/observation beds. It acts as a referral unit for 6 sub-centers and refer out cases to CHC (30 bedded hospital) and higher order public hospitals located at sub-district and district level. However, as the population density in the country is not uniform, the number of PHCs would depend upon the case load. PHCs should become a 24 hour facility with nursing facilities. Select PHCs, especially in large blocks where the CHC/FRU is over one hour of journey time away, may be upgraded to provide 24 hour emergency hospital care for a number of conditions by increasing number of Medical Officers, preferably such PHCs should have the same IPHS norms as for a CHC.

Standards are the main driver for continuous improvements in quality. The performance of Primary Health Centers can be assessed against the set standards. Setting standards is a dynamic process. Currently the IPHS for Primary Health Centers has been prepared keeping in view the resources available with respect to functional requirement for Primary Health Centre with minimum standards such as building manpower, instruments, and equipments, drugs and other facilities etc.

The overall objective of IPHS for PHC is to provide health care that is quality oriented and sensitive to the

Manpower recommended under IPHS is as follows:

Staff	Essential	Desirable	Desirable
		with 24x7 Nursing Facilities	with 24x7 Emergency hospital care facilities #
Medical Officer	2	2	Same IPHS norms as for CHC to be followed.
AYUSH practitioner		1 (AYUSH or any ISM system prevalent locally)	
Account Manager		1	
Pharmacist	1	2	
Nurse-midwife (Staff) (Nurse)	1	5	
Health workers (F)	1	1	
Health Asstt (Male)	1	1	
Health Asstt. (Female)	1	2 (one for three sub centers)	
Ophthalmic Assistant	1		
Multi-Rehabilitation Worker /Community Based Rehabilitation Worker.		1	
Clerks	2	2	
Data handler	1		
Laboratory Technician	1	2	
Driver	1	Optional/vehicles may be outsourced	
Cold Chain & Vaccine Logistic Assistant		1	
Class IV	4	4*	
Total	17	25	

* One of the 4 Class IV employee may be identified as helper to Cold Chain & Vaccine Logistic Assistant & trained

If the CHC/FRU is over one hour of journey time away the upgraded PHC should have 24 hour emergency hospital care with Emergency obstetric care facilities.

needs of the community. These standards would help monitor and improve the functioning of the PHCs.

There are 23458 PHCs functioning in the country as per Rural Health Statistics Bulletin published in July, 2009.

Service Delivery

- All "Minimum Assured Services" or **Essential** Services as envisaged in the PHC should be available, which includes routine, preventive, promotive, curative and emergency care in addition to all the national health programs. The services which are indicated as **Desirable** are for the purpose that we should aspire to achieve for this level of facility.
- Appropriate guidelines for each National Program for management of routine and emergency cases are being provided to the PHC.
- All the support services to fulfill the above objectives will be strengthened at the PHC level.

Minimum Requirement for Delivery of the Above-mentioned Services

The following requirements are being projected based on the basis of 40 patients per doctor per day, the expected number of beneficiaries for maternal and child health care and family planning and about 60% utilization of the available indoor/observation beds (6 beds). It would be a dynamic process in the sense that if the utilization goes up, the standards would be further upgraded. As regards, manpower, one more Medical Officer (may be from AYUSH or a lady doctor) and two more staff nurses are added to the existing staff strength of PHC to make it 24x7 service delivery centre.

Facilities

A list of manpower, equipment, furniture and drugs needed for providing the assured and desirable services at the PHC has been suggested under IPHS for PHCs. A Charter of Patients' Rights for appropriate information to the beneficiaries, grievance redressal and constitution of Rogi Kalyan Samiti/ Primary Health Centre Management Committee for better management and improvement of PHC services with involvement of Panchayati Raj Institutions (PRI) has also been made as a part of the Indian Public Health Standards. The monitoring process and quality assurance mechanism is also included.

Modifications recommended under revised draft 2010 are as follows:

I. Infrastructure: Added

i. signage's,
ii. barrier free access,
iii. disaster prevention measures (desirable for new upcoming facilities),
iv. Environmental friendly features,
v. computer facility with internet for MIS,
vi. Provision new born care corner in the facility,
vii. One room for counseling,
viii. Waste disposal pit,
ix. Cold chain logistic and generator room,
x. boundary wall,

II. Manpower: the new IPHS recommends the changes in manpower at PHC

i. One ophthalmic assistant for every PHC
ii. One Multi-Rehabilitation Worker or Community Based Rehabilitation worker (desirable)
iii. One data handler
iv. One cold chain and vaccine logistic assistant (desirable)

III. Drugs: The newly revised list of *essential drug* and the drug list for *obstetric care* have been incorporated.

IV. Equipment: The list updated.

V. Immunization schedule updated and is mentioned in the annexure.

VI. Standards of existing programs were updated based on the inputs from various program division along with new standards added for following newly launched (non communicable) disease programs.

i. National Program for prevention and control of deafness.

Manpower recommended under IPHS is as follows:

Manpower	Essential	Desirable
Health Worker Female (ANM)	1	+1
Health Worker Male	1	
Safai-Karmachari* (Contractual)		1

* One contractual Safai-Karmachari may be provided from the untied fund provided under NRHM

ii. National Mental Health Program.
iii. National Cancer control program.
iv. National program for prevention and control of Diabetes, CVD, and Strokes.
v. National Iodine deficiency Disorders control program
vi. National program for prevention and control of Fluorosis: in-affected Districts
vii. National Tobacco Control program
viii. National program for health care of Elderly
ix. Oral Health
x. Disability, physical medicine and rehabilitation services.
xi. The Integrated Counseling and Testing Centre (ICTC) has been added (Desirable)

VII. Job Responsibility of health personals is updated.

VIII. Reporting format under Integrated Disease Surveillance Project included

IX. Checklists for monitoring and facility survey updated.

X. Facility based MDR (Maternal Death Review) is added and is supposed to be one of the desirable services at PHC.

Subcenters

In the public sector, a Sub-Health Centre (Sub-centre) is the most peripheral and first contact point between the primary health care system and the community. As per the population norms, one Sub-centre is established for every 5000 population in plain areas and for every 3000 population in hilly/tribal/desert areas. A Sub-centre provides interface with the community at the grass-root level, providing all the primary health care services. As sub-centers are the first contact point with the community, the success of any nationwide program would depend largely on well functioning sub-centers providing services of acceptable standard to the people. The current level of functioning of the Sub centers is much below the expectations.

In order to provide Quality Care in these Sub-centers, Indian Public Health Standards (IPHS) are being prescribed to provide basic primary health care services to the community and achieve and maintain an acceptable standard of quality of care. These standards would help monitor and improve functioning of the sub-centre.

Service Delivery:

- All "Minimum Assured Services" or **Essential** Services as envisaged in the sub centre should be available, which includes preventive, promotive, few curative and referral services in addition to all the national health programs. The services which are indicated as **Desirable** are for the purpose that we should aspire to achieve for this level of facility.
- All the support services to fulfill the above objectives will be strengthened at the Sub-centers level.

Minimum Requirement for Delivery of the Above-mentioned Services

The following requirements are being projected bases on the expected number of beneficiaries for maternal and child health care, immunization, family planning and other services. As far as manpower is concerned, one more ANM is provided in addition to the existing one ANM and one Male Health Worker.

Facilities

A list of equipment, furniture and drugs needed for providing the assured services at the Sub-centers has been included under IPHS. A Model Citizen's Charter for appropriate information to the beneficiaries, grievance redressal and constitution of Village Health and Sanitation Committee for better management and improvement of Sub-centers services with involvement of PRI have also been made as a part of the Indian Public Health Standards. The monitoring process and quality assurance mechanism is also included.

Modifications recommended under revised draft 2010 are as follows:

I. Services to be provided have also been defined as per the site of service delivery: In the village, during home visits, during surveys, in the community and at the facility.

II. Manpower: this IPHS recommends the provision of Safai Karamachari at the Subcentre level on contractual basis from untied fund in order to keep the facility clean.

III. Standards of existing programs were updated based on the inputs from various program division along with new standards added for following newly

launched (non communicable) disease programs.

i. National Program for prevention and control of deafness.
ii. National Mental Health Program.
iii. National Cancer control program.
iv. National program for prevention and control of Diabetes, Cardio Vascular Diseases, and Strokes.
v. National Iodine deficiency Disorders control program
vi. National program for prevention and control of Fluorosis: in-affected Districts
vii. National Tobacco Control program
viii. National program for health care of Elderly
ix. Oral Health
x. Disability, physical medicine and rehabilitation services.

IV. New borne care corner added where ever deliveries are taking place.

V. Immunization schedule updated and is mentioned in the annexure.

VI. Job Responsibility of Health Workers, updated

VII. List of Drugs and Equipments updated

VIII. Reporting format for syndromic surveillance under Integrated Disease Surveillance Project included

IX. Checklists for monitoring and facility survey updated.

NATIONAL HEALTH ACCOUNTS

National Health Accounts (NHA) is an effective tool to support health system governance and decision making by not only capturing financial flows but by also providing information relevant to designing better and more effective health policies. The first NHA for India was developed for the fiscal year 2001–02. National Health Accounts is a tested and internationally accepted tool to determine a nation's health expenditure. The current estimates, the second in the series has been prepared for the fiscal year 2004–05 with a three fold objective:

- Possibility of scientifically estimating out of pocket expenses based on the NSSO 60th Round on Morbidity, Healthcare and the Condition of the Aged of 2004 (given the fact that out of pocket expenses contribute to almost over 70% of total health expenditure in India).
- Provide a comprehensive base line particularly for component wise public health spending given the launch of the major public health intervention, the National Rural Health Mission in April, 2005.
- Assess the segment–wise total health spending post–NRHM with clear focus on public expenditure and its impact on Out of Pocket (OOP) expenses.

Besides giving a disaggregated picture of public and private health expenditure for 2004–05, the report also provides the provisional estimates of the total health expenditure for the period 2005–06 to 2008–09. The distribution of total health expenditure and its share in GDP is reflected in the Table 6.1 & 6.2.

Under private expenditure, households contribute a significant portion at 71.13% of total health expenditure. Private Provider of Health constituted 76.74% of total health expenditure in 2004–05 as against 20.97% by public providers.

The per capita health expenditure for India in 2004–05 was Rs. 1201 of which the share of public was Rs. 242 (20.18%) and that of private was Rs. 959 (79.82%). Public expenditure as a share of Gross State Domestic Product (GSDP) was less than 1% for all the major states except Bihar where this was 1.12%. Public expenditure varied within a range of 3 to 4%

Table 6.1: Health expenditure in INDIA 2004-2005 (in Rs.000)

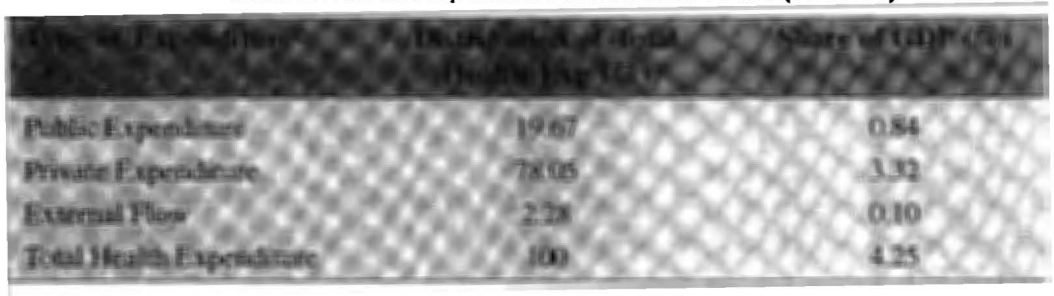


Table 6.2: Fund Flow to Health Sector by Source 2004–05

A-Public Funds	
Central Government	6.78
State Government	11.97
Local bodies	0.92
B-Private Funds	
Households	71.13
Social Insurance Funds	1.13
Firms	5.73
NGOs	0.07
C-External Flows	
Central Government	1.56
State Government	0.24
NGOs	0.47
Grand Total	100.00

for all the major states except Maharashtra where it was 2.88%. Among the major states 10 states show private spending in the range of 81 to 90%. Himachal Pradesh has been the only state where private sector expenditure in 2004–05 was 58.3% of total health spending.

In India while both health expenditure as percentage of GDP and public spending as percentage of total health Expenditure is low when compared to developed countries, the scenario is different in comparison to Southeast Asian countries. Health Expenditure as percentage of GDP in India is higher than Asian economies – China, Malaysia, Sri Lanka, Thailand, Pakistan and Bangladesh though public spending as percentage of total health expenditure is significantly lower than all these countries except Pakistan.

Provisional Estimation of Health Expenditure for 2005–06 to 2008–09

Health expenditure as a share of GDP has reached 4.13% in 2008–09. Further the share of public expenditure in GDP has increased consistently during 2005–06 to 2008–09. It has reached 1.10% in 2008–09 from 0.96% in 2005–06. Though health expenditure has increased in absolute terms, the proportionately higher growth of GDP has resulted in a moderate increase in the share of health expenditure to GDP over the years.

As per WHO, total health expenditure includes all expenditure whose primary purpose is to restore, improve and maintain health for nation and for individuals during a defined time period. The preparation of NHA has been guided by the approach set out in the Producers Guide. The methodology set out in the Guide expands the system of health accounts classification to facilitate collection of health expenditure in a disaggregated manner as demanded in a pluralistic system of health financing and delivery.

The NHA includes expenditure on inpatient and outpatient care, hospitals, specialty hospitals, promotive and rehabilitative care centres, capital expenditure on health by public, medical education and research etc and excludes water supply sanitation, environment health and noon meal program.

Methods and Sources

The data collected through the 60th round of the NSSO {National Sample Survey Organization (Report of the 60th round on Morbidity, Healthcare and Condition of the Aged, 2004)} forms the source of data to estimate household expenditures on health. The data collected by the NSSO refers to the period from January to June 2004. For the purpose of NHA 2004–05, adjustment procedures have been adopted of the OOP (Out of Pocket) expenditures from the NSSO so as to refer to the period April 2004 to March 2005. The same procedure was followed for estimating each component (ANC, PNC, Delivery, Abortion & Still Births and Immunization) of OOP except Family planning for which the estimates was based on the data available from National Family Health Survey-3 on family planning methods and their average expenditure.

NHA Entities and Matrices

In NHA, health expenditures are measured and organized on the basis of entities. In the basic NHA framework there are four principal entities; financing sources, financing agents, providers and functions, in a health system. NHA tracks flow of funds across the health system starting from financing sources to the end point i.e. functions.

Methodological Refinements

These refinements include:

1. Expenditure heads under MoHFW have been carefully scrutinized and all items non classified earlier have been classified under appropriate

heads after an analysis of the nature of expenditure incurred.

2. Provider classification given in the Producers Guide has been further amplified in the 2004–05 estimation and the provider list restricted to entities that receive money for/or in anticipation of providing these activities. Also specific activities have been grouped under the relevant provider code. Illustratively:

- Activities like RCH, training etc. hitherto shown as separate items have been grouped under the relevant category.
- CGHS and ESIS earlier retained as separate providers have been classified in terms of providers under Dispensaries and Public Hospitals respectively.
- Expenditure under medical stores and drug manufacture shown as separate items has been now shown as provider of medical goods.

Limitations

Non availability of data in respect of entities like firms, NGOs, local bodies have constrained in estimating health expenditure in an inclusive manner. The absence of any single agency and the different nature of these entities along with the diversified functions they perform has not made it possible to meaningfully tap even the secondary sources of data for the purpose of estimation. Institutionalizing collection of these data is being initiated as expected to bridge this felt need.

Health Expenditure by Central and State Governments

In terms of spending 67.12% was for medical public health, 14.38% for family welfare purposes and 4.36% was capital expenditure. At the state level, more than 60% of the expenditure was incurred on allopathy where as just 26.54% was by the central government. Similarly for medical education and research the central government spent 16% of total expenditure whereas the state's spending was 9.77%. Health expenditure by function in 2004–05 has shown that among all functions primary care has been the focus both by the central and state government. While the centre spent 56% on primary care, for the states it was 38%. In the case of states for which this categorization has been done, it is seen that 18.67% had been spent on secondary care. In case of tertiary care the central government spent relatively higher percentage (25.22) against 21.84% by the states.

As per the international classification of health accounts (ICHA) 77.96% was incurred on curative care, followed by 8.07% on reproductive child health and family welfare, and 1.80% on medical education and research. The Ministry of Health and Family Welfare spent 26.16% on curative care (MOHFW 2009).

JANANI SURAKSHA YOJANA (JSY)

Janani Suraksha Yojana (JSY) is a safe motherhood intervention under the National Rural Health Mission (NRHM) being implemented with the objective of reducing maternal and neonatal mortality by promoting institutional delivery among the poor pregnant women. The Yojana, launched on 12th April 2005, by the Hon'ble Prime Minister, is being implemented in all states and UTs with special focus on low performing states. JSY is a 100 % centrally sponsored scheme and it integrates cash assistance with delivery and post-delivery care. The success of the scheme would be determined by the increase in institutional delivery among the poor families. The Yojana has identified the accredited social health activist (ASHA) as an effective link between the Government and the poor pregnant women in 10 low performing states, namely Uttar Pradesh, Uttaranchal, Bihar, Jharkhand, Madhya Pradesh, Chhattisgarh, Assam, Rajasthan, Orissa and Jammu and Kashmir. The remaining states have been named as High performing States (HPS). In other eligible states and UTs, wherever, AWW and TBAs or ASHA like activist has been engaged in this purpose, she can be associated with this Yojana for providing the services.

Role of ASHA or other link health worker associated with JSY would be to:

- Identify pregnant woman as a beneficiary of the scheme and report or facilitate registration for ANC,
- Assist the pregnant woman to obtain necessary certifications wherever necessary,
- Provide and / or help the women in receiving at least three ANC checkups including TT injections, IFA tablets,
- Identify a functional Government health centre or

an accredited private health institution for referral and delivery,

- Counsel for institutional delivery,
- Escort the beneficiary women to the predetermined health center and stay with her till the woman is discharged,
- Arrange to immunize the newborn till the age of 14 weeks,
- Inform about the birth or death of the child or mother to the ANM/MO,
- Post natal visit within 7 days of delivery to track mother's health after delivery and facilitate in obtaining care, wherever necessary,
- Counsel for initiation of breastfeeding to the newborn within one-hour of delivery and its continuance till 3-6 months and promote family planning.

Tracking Each Pregnancy: Each beneficiary registered under this Yojana should have a JSY card along with a MCH card. ASHA/AWW/ any other identified link worker under the overall supervision of the ANM and the MO, PHC should mandatorily prepare a micro-birth plan. This will effectively help in monitoring Antenatal Checkup, and the post delivery care.

Eligibility for Cash Assistance:

LPS	All pregnant women delivering in government health centers like sub-center, PHC/CHC/FRU/General wards of district and state hospitals or accredited private hospital.
HPS	BPL pregnant women, aged 19 years and above.
LPS and HPS	All SC and ST women delivering in a government health centers like sub-center, PHC/CHC/FRU/General wards of district and state hospitals or accredited private hospital.

Note: BPL Certification – This is required in all HPS states. However, where BPL cards have not yet been issued or have not been updated, States/UTs would formulate a simple criterion for certification of poor and needy status of the expectant mother's family by empowering the gram pradhan or ward member.

- Importantly, such woman in both LPS and HPS states, choosing to deliver in an accredited private health institution will have to produce a proper BPL or a SC/ST certificate in order to access JSY benefits. In addition she should carry a referral slip from the ASHA/ANM/MO and the MCH - Janani Suraksha Yojana (JSY) card.
- ANM / ASHA / MO should make it clear to the beneficiary that Government is not responsible for the cost of her delivery. She has to bear cost, while choosing to go to an accredited private institution for delivery. She only gets her entitled cash.
- While mother will receive her entitled cash, the scheme does not provide for ASHA package for such pregnant women choosing to deliver in an accredited private institution.
- Limitations of Cash Assistance for Institutional Delivery: In LPS states all births delivered in a health center-government or accredited private institutions. In HPS states upto 2 live births.
- Disbursement of Cash Assistance: As the cash assistance to the mother is mainly to meet the cost of delivery, it should be disbursed effectively at the institution itself.
- For pregnant women going to a public health institution for delivery, entire cash entitlement should be disbursed to her in one go, at the health institution. Considering that some women would access accrediting private institution for antenatal care, they would require some financial support to get at least 3 ANCs including the TT injections. In such cases, at least three-fourth (3/4) of the cash assistance under JSY should be paid to the beneficiary in one go, importantly, at the time of delivery.

Table 6.3: Scale of Cash Assistance for Institutional Delivery

Category	Rural Areas		Total	Urban Areas		Total
	Mother's Package	ASHA's Package	Rs.	Mother's Package	ASHA's Package	Rs.
LPS	1400	600	2000	1000	200	1200
HPS	700		700	600		600

In the District / Women's Hospital / State Hospital:

- State / District should allocate sufficient amount of money (based on the load of deliveries in these institutions) for each of these institution. This money should be kept in a separate account under the supervision of the *Rogi Kalyan Samiti.*
- All targeted expectant mother should carry a referral slip from the ANM/MO where she generally resides. This will, in fact, help all such pregnant woman who go to her mother's place for delivery.
- Disbursement of money to expectant mother going to her mother's place for delivery should be done at the place she delivers. The entitlement of cash should be determined by her referral slip carried by her and her usual place of residence.
- A **voucher scheme** may be introduced in such a way that along with admission slip for delivery, a voucher amounting to mother's package plus the transport assistance money is given to the expectant mother and that she should be able to encash the same at the Hospital's cash counter, at the time of discharge.

Flow of Fund

- State/ District authorities would advance Rs. 5000 and Rs.10,000 to each ANM in HPS /LPS States respectively as a recoupable impressed money from the JSY fund.
- This money could be kept in the joint account of ANM and Gram Pradhan, as in case of untied fund placed with sub-centers so that the ANM could 'roll' the entire amount by advancing Rs.1500 to Rs. 2,500/- to ASHA / AWW per delivery and later she could recoup it from the PHC or CHC, where JSY fund is parked by the authorities.
- ASHA Package: This package (Table 6.3), as of now, is available in all LPS, NE States and in the tribal districts of all states and UTs. In rural areas it includes the following three components:
  - (a) **Cash assistance** for **Referral transport** to go to the nearest health centre for delivery. The state will determine the amount of assistance (should not less than Rs.250/- per delivery) depending on the topography and the infrastructure available in their state. It would, however, be the duty of the ASHA and the ANM to organize or facilitate in organizing referral the transport, in conjunction with gram pradhan, Gram Sabha etc.
  - (b) **Cash incentive to ASHA:** This should not be less than Rs.200/- per delivery in lieu of her work relating to facilitating institutional delivery. Generally, ASHA should get this money after her postnatal visit to the beneficiary and that the child has been immunized for BCG.
  - (c) **Transactional cost** (Balance out of Rs.600) is to be paid to ASHA in lieu of her stay with the pregnant woman in the health centre for delivery to meet her cost of boarding and lodging etc.. Therefore, this payment should be made at the hospital/ heath institution itself.

Subsidizing cost of Caesarean Section or management of Obstetric complications: Generally PHCs/ FRUs / CHCs etc. would provide emergency obstetric services free of cost. Where Government specialists are not available in the Govt's health institution to manage complications or for Caesarean Section, assistance up to Rs. 1500/- per delivery could be utilized by the health institution for hiring services of specialists from the private sector. If a specialist is not available or that the list of empaneled specialist is very few, specialist doctors working in the other Government set-ups may even be impaneled, provided his/her services are spare and he/she is willing. In such a situation, the cash subsidy can be utilized to pay honorarium or for meeting transport cost to bring the specialist to the health centre. It may however be remembered that a panel of such doctors from private or Government institutions need to be prepared beforehand in all such health institutions where such facility would be provided and the pregnant women are informed of this facility, at time of micro-birth planning.

Assistance for Home Delivery: In LPS and HPS States, BPL pregnant women, aged 19 years and above, preferring to deliver at home is entitled to cash assistance of Rs. 500/- per delivery. Such cash assistance would be available only upto 2 live births and the disbursement would be done at the time of delivery or around 7 days before the delivery by ANM/

ASHA/ any other link worker. The rationale is that beneficiary would be able to use the cash assistance for her care during delivery or to meet incidental expenses of delivery. It should be the responsibility of ANM/ASHA, MO PHC to ensure disbursement. It is very important that the cash is disbursed in time. Importantly, such woman choosing to deliver at home should have a BPL certificate to access JSY benefits.

Compensation Money: If the mother or her husband, of their own will, undergoes sterilization, immediately after the delivery of the child, compensation money available under the existing family welfare scheme should also be disbursed to the mother at the hospital itself.

It should be ensured that ASHA keeps track of all expectant mothers and newborn. All expectant mother and newborn should avail ANC and immunization services, if not in health centres, atleast on the monthly health and nutrition day, to be organized in the Anganwadi or sub-centre,

Possible IEC strategy:

- To associate NGO and Self Help Groups for popularizing the scheme among women's group and also for monitoring of the implementation.
- To provide wide publicity to the scheme by: Monthly Village Health Day, Health Melas etc,
- Printing and distributing JSY guidelines, pamphlets, notices in local languages at SC/PHCs/CHCs/ District Hospitals/ DM's and Divisional Commissioner's office and even in at the accredited Pvt. Nursing Homes, in abundance.
- Facilitate organizing workshops and meetings in villages / blocks - by women's group, local leaders (PRIs), Opinion Maker, at functional health institutions on promoting maternal health in general, Institutional Delivery and JSY.
- Supporting women self help Groups and NGOs for promoting the scheme.
- Facilitating woman Panchayat member to take review of Janani Suraksha Yojana (JSY)

Establish a grievance redressal cell in each district, under the District Project Management Unit, mainly to facilitate meeting people's genuine grievances on –a) Eligibility for the scheme, b) Quantum of cash assistance, and c) Delays in disbursement of the cash assistance,

Prepare Monthly Work Schedule: In the monthly meeting, the ANM, besides reviewing the current month's work vis-à-vis envisaged activities, should prepare a Monthly Work Schedule for each ASHA / village level health worker of following aspects of the coming month:

- **Feed back on previous month's schedule**
  - (a) Number of pregnant women missing ANCs,
  - (b) No. of cases, ASHA/link worker did not accompany the pregnant women for Delivery,
  - (c) Out of the identified beneficiary, number of Home deliveries,
  - (d) No. of post natal visits missed by ASHA,
  - (e) Cases referred to Referral Unit (FRU) and review their current health status,
  - (f) No. of children missing immunization.

While no target needs to be fixed, but for the purpose of monitoring, some monthly goal of institutional delivery for the village may be kept.

A format of monthly work schedule to be filled by the ANM /ASHA incorporating the physical and financial aspect may be printed.

Reporting: For the purpose of reviewing the progress of implementation and also for allocating fund, under the RCH-flexi Pool, all States would provide: a) Annual District-wise report, reaching MoHFW in the month of April of the following financial year; b) Quarterly Report as per standard format, reaching MoHFW in the month following the end of the Quarter.

Any deviation from the above process will not be accepted by the Central Government and that such expenditure will not be treated as legitimate utilization of the fund given under JSY. It may be noted that all payments before or after seven days of delivery will be treated as illegitimate subject to audit objection.

JSY should focus on reasons for why women are not going to hospitals for their deliveries. Majority do prefer home delivery because of their tradition. Some have fear of hospital and its staff rude behavior particularly in urban slums (Khan Z et al 2009). Financial incentive alone would not attract women to institutional

deliveries. It should be associated with improvement of quality of services and better social networking. According to JSY the institution could be subcenter where health services and health manpower is not always existing that need to be upgraded.

Comments on JSY

Comments are based on statements made by Renu Khanna from SAHAJ, Vadodara; S Wafai, Regional Director North States, Rajesh Garg, and thesis work of Ashoo Singh and indepth interview with medical officers posted in PHCs of Maharashtra, Odisha:

1. Up gradation of the facility as per the Indian Public Health Standard and keeping the quality in mind is not achieved. As a result, women are more exposed to infections in the facility than their homes.

2. Some pregnant women are referred to a nearby private hospital from FRUs. In such cases the ASHAs don't get any incentive which demotivates her as the referral was not because of her but because of deficiency or nonfunctioning of FRUs.

3. A recent MaPeDIR (Maternal & Perinatal Death Inquiry Response) shows more than 60% die during postnatal period and at least 44% during first 24 hours. JSY has not responded to this by creating additional beds in hospitals to retain them in post delivery period.

4. Many women are unable to access the institution because of geographical barriers, especially in the rainy season. Not paying anything to the ASHA in such cases demotivates them. There are many villages which are cut off from the main land during rainy season where ASHAs should be paid if they ensure the other mandates of JSY except Institutional Delivery (ID).

5. Due to political pressures in Orissa hospitals are paying JSY incentive to women under going ID without verifying whether ANC was done or not. Such knee jerk reaction from the administration makes it a dole program and the essence of the program is lost with the people.

6. The basic agenda of JSY gets flouted when doctors in government institutions prescribe medicines and consumerables to be brought pre-delivery under the pretext that there is no adequate supply. Most women are enticed with the promise of free delivery by the ASHA. Such premium can range from Rs. 200 to 1000. It has to be stopped at any cost as ASHAs have to face the ire of these women when they shell out money in the hospitals. Providers expecting favors such as getting sweets or other small gifts because they know that the delivered woman is getting Rs 1400 from hospital. In a study conducted in UP by Kumar V et al 2015 stated that all of the health care providers perceived JSY as beneficial for improving maternal health, 44% of them had the notion that cash incentives under JSY can have a negative effect on family planning practices.

7. Mothers with their babies have to queue up at the local bank to receive payment. Most of them don't have bank accounts, they are at the mercy of the bank officials who are generally rude to them. To avoid this generally they pay bribe to hospital attendants or middle men or bank staff to get the cheque. Bank account can be opened during the pregnancy with the help of ASHAs. Similar to NREGA payments through bank accounts, JSY payments can also be done. There should be some flexibility during the monetary disbursements at the local level and this should be widely publicized (Suvarna Devi P. 2009).

8. As per the JSY Guidelines for Implementation, the payment of incentive money to the Accredited Social Health Activist (ASHAs) must be made in two installments. 50 % after discharge of the JSY beneficiary from the health centre provided the ASHA or an equivalent worker has accompanied the pregnant woman to the health centre for delivery. The remaining 50% of the cash incentive would be given one month after delivery when BCG vaccine has been administered to the child and she has helped in postnatal care and registration of birth of the newborn.

Anecdotal evidence suggests that ASHAs are paid the incentive money in one installment to reduce the administrative burden. Thus, the follow up after delivery by ASHAs is sadly lacking and the focus is only on collection of incentive money. However, the possibility of maternal or neonatal deaths and complications is highest till seven days after delivery. Unfortunately, there is no surveillance done during these crucial days

9. Since the ASHAs are not paid on time, the cost of transport to the hospital is generally borne by the pregnant women and never reimbursed by the ASHA. The payment of ASHAs is at the hands of the Sub centre ANMs who expect a cut to release the money forgetting that they get a salary whereas ASHAs don't.

Table 6.4: Progressed made in NRM

Expected Outcome	Baseline 2005	2010	2015
IMR reduced to 30/1000 live births by 2012	58	50	39
MMR reduced to 100/1 lakh by 2012	301	254	167
TFR reduced to 2.1 by 2012	2.9	2.6	2.3
Leprosy elimination <1/10000	0.7	0.7	0.6
Malaria Mortality reduction -50% up to 2010	60.3	-	26
Kala Azar mortality reduction 100% by 2010	-	56.2	-.
Falaria Rate-70% by 2010, 80% by 2012 and elimination by 2015		26.7	-
Dengue mortality reduction -50% by 2010 and sustaining until 2012		43.5	-
Jepanese Encephalitis % Reduction		*3*	
Cataract operation increasing to 46 lakh by 2012		32.59	
Leprosy rate-reduction from 1.8/10000 to less than 1	1.8	0.9	0.77
TB DOTS 85% cure rate	-	87	
Iodine Deficiency Disorders Prevention % iodized		87.3	
IDSP State & District sending report		35/619	>100
ASHAs	-	842654	866726
ASHAs with drug kits	-	649568 (87.3%)	96%

ANM does the immunization and it is generally done in the anganwadi centre which makes them eligible to demand a cut despite the fact that it is a part of their duty. Sharing of motivation money in case of sterilization has been almost legalized. Though ASHA had motivated the women, she is forced to share the incentive with the ANM because she dresses the wound of the sterilized women.

10. There is lack of information about the schemes among people and they have perception that quality of care provided is poor or not satisfactory at health centers. We need to shift the focus from Institutional Deliveries to Safe Deliveries.

11. The JSY form is too long and there are bound to be areas in the format that are not covered for which the data is made-up. There is a need to review it and shorten it.

12. Antenatal and postnatal body weight and Body Mass Index (BMI) of mother and baby is a long term measure which will show improvements if MCH care is followed carefully. Clearly the amount disbursed should not be the only indicator of maternal health care provision (Rajalakshmi 2007, Suvarna Devi P. 2009).

13. Sustained increase in institutional deliveries is not true however they are occuring in private or home and reported and recorded in institutions after the deliveries have already happened. It is just because of targets set under the NRHM for disbursment of money allocated to the PHC or Block level. Neither ASHA nor ANM is conducting deliveries. In many places they are not efficient enough to do so. However false records are always maintained very well.

14. The delivery load skewed towards tertiary care and District Hospitals.

15. Quality of care regarding ANC coverage and Institutional delivery is a matter of concern. In a study conducted in UP on 246 mothers, it was found that nearly half (53.25%) of the mothers studied had an institutional delivery and were eligible for the JSY benefi ts. Postnatal home visits by Accredited Social Health Activists were done in 48% of home and 100% of institutional deliveries. Nearly half (48.09%) of the beneficiaries were benefited by free transport facility under JSY. The utilization rate of the JSY services was found to be low in certain aspects like institutional deliveries, transport facility etc., and there is scope for improvement (Kumar V et al 2015).

16. Duration of the Post-natal stay of mothers at facilities appears to be increasing, but in the poor performing six states of Chhattisgarh, Uttar Pradesh, Bihar, Jharkhand, Uttarakhand and Nagaland, the newly delivered mothers are still leaving soon after delivery.
17. C- section rate less than 10% were reported across the states. multi-skilled medical officers performing C-sections.
18. Referral of complications to the private sector, due to lack of skills or confidence in the public system to manage complications continues to be a problem.
19. Payments of JSY delayed at peripheral facilities.
20. Blood storage facilities are difficult to establish and most non DH FRUs are getting their blood from the DH on demand.

PROGRESS OF NHM

Midterm review of the NRHM indicates that there is improvement in various health indicators (Table 6.4) but it is not uniform through the country and some states did very well but some still have to catch up with the national average.

NRHM stresses upon two major areas for strengthening:
1) Increasing Health Personnel
- More doctors,
- More Nurses and ANMs
- More specialists and Lab technicians
- ASHAs for every village

2) Improving Health Infrastructure
- Funds provided for essential drugs
- Diagnostics, equipments for effective treatment
- Mobile medical units and Ambulances for emergency services
- Renovated buildings
- Telephones for better communication

The Indian public Health Standard define structural, personnel, equipment and management standards and have already been finalized for the CHCs. Standards for the Sub Centers, PHCs and District Hospitals are prepared.

- ✔ Rogi Kalyan Samitis: 607 DHs, 4501 CHCs, 1460 other than CHC hospitals, 17338 PHCs and 7610 other health facilities have their own Rogi Kalyan Samitis with untied funds for improving quality of health services. Number of meetings of RKS has decreased and need to be strengthened.
- ✔ ASHAs: 866726 ASHAs/Link workers are working and 96% ASHAs with Drug kits in their respective villages by Dec 2012.
- ✔ Village Health and Sanitation Committees (VHSCs): more than 75% villages have their own village health and sanitation committees. All have also received the Rs. 10,000/- untied grants for local action. More Anganwadi were sanctioned. 10,99898 anganwadi (81%) were operationlized.
- ✔ Village health and Nutrition Days: 69.25lakh in 2011-12 village health and nutrition days organized at ICDS center to reach basic health services.
- ✔ There are 147045 Subcenters by 2012 and many have two ANMs.
- ✔ 24X7 Health Facilities in Rural Areas: a total of 23887 APHCs, PHCs, and 4211 CHCs out of 4809 and other sub District Facilities are functional 24X7.
- ✔ More than 8500 PHCs and 1000 CHCs are equipped with modern facilities.
- ✔ Additional of Human resources including program managers units with district program managers account managers, data managers, block managers, and accountants are added under NRHM.
- ✔ Janani Suraksha Yojana: over 2.7 crore beneficiaries are covered.
- ✔ Mobile Medical Units are functioning.
- ✔ AYUSH: more than 11,000 health facilities have co-located with AYUSH services where AYUSH doctors and paramedics are functioning.
- ✔ Funds: Flexibility in utilization of fund for accessible and affordable health services through PRI and community organizations are provided:

Village & subcenter level
- Rs. 10,000 per year to every village Health & Sanitation Committee.
- Rs. 10,000 per year to subcenter for untied health action.
- Rs. 10,000 per year to subcenter with building maintenance.

PHC
- Rs. 50,000 per year to every PHC for maintenance.
- Rs. 25,000 per year to every PHC for untied health action

- Rs. 1,00,000 per year to PHC level Rogi Kalyan Samiti.

CHC

- Rs. 1,00,000 per year to every CHC for maintenance
- Rs. 50,000 per year to every CHC for local health action.
- Rs. 1,00,000 per year to every CHC level Rogi Kalyan Samiti.

District

- Rs. 5,00,000 per year for hospital level Rogi Kalyan Samiti.

Other important developments by the government

- National Policy on Mental Health was released in 2014;
- Draft of National Health Policy 2015 put in public domain;
- "Mission Indradhanush" was launched to vaccinate all children against seven vaccine-preventable diseases;
- Three new vaccines, including indigenously developed vaccines against rotavirus, rubella, were introduced as part of the Universal Immunisation Program; a fourth vaccine for adults to protect against Japanese encephalitis is to be introduced in high-priority districts;
- The Universal Health Assurance Mission (UHAM) ws prepared to envisage universal health insurance that will be free for all persons below the poverty threshold and available at low premium for the rest of the population to be overseen by an autonomous oversight body;
- Several new institutions were sanctioned for health professional training and research, including two National Institutes of Ageing, a national-level research and referral institute for higher dental studies, new regional and national institutions for Allied Health Sciences, 15 Model Rural Health Research centres, 20 state cancer institutes, and 50 tertiary care cancer centres;
- Excise tax was increased on cigarettes and smokeless tobacco products and pictorial warnings on tobacco product packages covering 85%;
- Focus was renewed on the eradication of Kala Azar and the elimination of lymphatic filariasis by 2015;
- The National Newborn Action Plan was launched on Sept 18, 2014, with the target of reducing neonatal deaths to less than ten per 1000 livebirths by 2030;
- The Integrated Action Plan for Prevention and Control of Pneumonia and Diarrhoea was launched to reduce deaths among children younger than 6 years of age;
- The indigenous medicine systems accorded a separate ministry status and a national mission on AYUSH (Ayurveda, Yoga and naturopathy, Unani, Siddha, Homoeopathy) was launched;
- States' Drug Regulatory and Food Regulatory Systems are to be strengthened by creating new drug testing laboratories;
- The voice-based 24 x 7 toll-free National Health Portal was launched;
- Kayakalp, a national initiative to award public health facilities that show high levels of cleanliness, hygiene, and infection control, was introduced;
- The Allied and Healthcare Professional Bill 2015 was drafted and placed in the public domain for comments;
- Rashtriya Swasthya Bima Yojana, a health insurance scheme for families living below poverty line was brought under the purview of the Ministry of Health and Family Welfare from the Ministry of Labour
- Social sector schemes were introduced, including insurance schemes to cover both natural and accidental death risk and the Clean India Mission to clean streets, towns, and infrastructure throughout the country;

COMMENTS

1. *Evidence-based policy:* There is no systematic analysis of previous policies, and no major lessons seem to have been learnt from the past. The NRHM documents do not appear to analyze why the Primary Health Care approach was never implemented effectively and the goals of health for all by 2000 have not been met, a quarter of a century after they were declared (Shukla 2005). All policies and missions should be evidence-based and not emotional based so that failure can be avoided.
2. *NRHM as the umbrella for the whole health programs:* NRHM has included all major health

programs and rightly seek coordination with other sector water, sanitation, nutrition, etc. However, many important programs are left out such as National Mental Health Program, Injury Prevention, Rabies Control, etc. Their burden on public health is huge and required special attention.

3. *Budget:* The Common Minimum Program has promised an increase of Central health care expenditure from 0.9% to 2-3% of GDP. In the 2005-2006 Budget, the health care budget has not increased and remained at 0.9% only. Moreover, increased allocation for four ongoing programs (AIDS Control, Reproductive & Child Health, Medical Education, and Indian System of Medicine) account for 1,540 crore, leaving only about Rs. 320 crore for the National Rural Health Mission per se. It could be considered another eye wash and lofty pronouncement. The fund for NRHM appears as a consolidated repackaging of various existing national programs with the single chunk being contributed by the RCH program.

   The Proposal that additional 10% levy on cigarettes, gutka, chewing tobacco, would be used to part-finance the NRHM is not a good idea because that money should be used on de-addiction, rehabilitation of families, and on alternative employment opportunities. In 2002, for instance, the private sector account for 78.7% of total health expenditure, while public expenditure made up just 2.3%. This little public money made available to health care has not reached to people who need it the most. Three times the sum that goes to the poorest quintile of the population (living below the poverty line), reaches the richest quintile, and an estimated four-fifths of the money goes in paying salaries. This lack of adequate and effective public provisioning has seen a decline by 30% in the proportion of patients seeking public health care between 1986-96. Ultimately, those who can afford it the least, end up spending the most on health (Indian Express 2006). Recent government also slashed the budget for NHM in May 2014, as much as 20-50% in several critical areas of health spending. Urgent increase in budget allocation on health is required. Following observations are made as far as financing is concerned evaluation:
   - *Activity-wise transfer of funds from state to district* often with many delays for some line items.
   - Untied funds blocked in facilities which have poor turnover and utilization.
   - Lack of guidelines.
   - Weak management structures leading to poor progress of programmes themselves.
   - Problems in book-keeping were reported from many states mainly due to lack of training or qualifications among those holding or supervising accounting functions at the facility and block level – often even at the district level.
   - Most states do not have a separate finance manager and a separate accounts manager
4. *Resources:* NRHM should focus on waste of resources and poor accountability. Expenditure should be based on scientific debate among public health experts before launching low priority or unrealistic programs like Universal hepatitis-B, rota virus immunization, and developing more than 12 AIIMS like institutions and giving undue importance to certain tertiary medical institutions. Allowing resource diversion to Public Health Foundation of India is another example of resource mismanagement.
5. The *Community Health Workers/Village health worker Scheme* was launched in 1978, which failed. The VHGs were provided a monthly honorarium, however, no such payment would be made to ASHA. We should learn from the history and should not repeat the same mistakes which we committed during implementation of VHG scheme. Reconceptualizing the scheme in the form of Accredited Social Health Activist (ASHA) should incorporate the remedy to those issues, which led to the failure of CHW scheme. ASHA should be local, permanent resident of the village with basic education and should be adequately remunerated. Performance based remuneration is very tricky and may be implemented after field based experimentations.

   Education selection criteria for ASHA is eighth class pass women which is next to impossible in poor and disadvantage groups in India. Keeping the criteria rigid, it will impose bias against women from disadvantaged groups and women with

strongest social motivation, women who are representative of deprived groups are likely to get excluded from the program.

A scheme for training of dais was initiated during 2001-02. the scheme is being implemented in 156 districts in 18 states/UTs in the country. The districts were selected on the basis of the safe delivery rates being less than 30%. The scheme was extended to all the districts of poor performing states and also to J&K, Andoman & Nicobar island. Under this scheme 121017 dais were trained. Now under the NRHM ASHA will take over the charge of village then where these dais will go and what will they do? Huge resources are exhausted on training of these dais and now new group of workers (ASHA) will received training. It is just waste of resources. It has been observed that ASHAs are not coordinating with AWW and members of Village health committee. Half of the delivered mothers informed that they had been visited by *Sahiya* (ASHA in Jharkhand) (Haider S et al 2008).

6. *For ASHAs lodging arrangements* (ASHA Gruha) and help desks are available. But following are main problems:

   a) Drug kit replenishment remains a problem.

   b) Coordination between AWWs, ANMs and ASHAs is not very good.

   c) ASHA services not reaching to every household in some states.

   d) Payments to ASHA irregular

   e) Lack of effective institutional level support structures

   f) Weak supervision.

7. *Performance based payment:* ASHAs were recruited and trained but when they learned that payment is based on their performance and it is not permanent government service then 20-30% ASHAs are dropped out. In some states ASHAs are not paid under JSY which has demoralized them. In some districts home deliveries are counted as institutional deliveries and paid under JSY. In many places JSY beneficiaries are not getting payment. Similar experiences are observed in Maharashtra, UP, Haryana, and Punjab. Most of the beneficiaries perceived that there is lack of transparency in money distribution. Many have not got money that could be due to their ignorance of scheme (Malini S et al 2008).

   Capital spending that provides building for hospitals and clinics and provides other basic amenities made up only 52% of the budgetary outlay. Spending on the National Health Mission (NHM), which is designed to provide basic services on the ground through a network of accredited social health activists (ASHAs) who are paid a pittance every month, was cut by about 20%, as were the transfers to state governments to fund their health plans. As a result the NHM is in a mess, ASHAs in several states have not received their tiny salaries for the past 3-6 months, and many activities have come to a standstill. Similarly, the Integrated Child Development Services (ICDS) scheme, which provides nutrition and other services to pregnant and lactating mothers and infants, received about 10% less than was budgeted (*BMJ 2015).*

8. *Many posts of second ANM are lying vacant.* Male worker availability has improved- but many states still have large gaps.
   Sub Centers are no longer seen as site of delivery- ICDS component is missing in VHNDs

9. *Human Resource:* Addition of 1,00,000 new service providers over 5 years.
   The situation is much more optimistic in ANMs and nurses, with an almost 300% increase in seats – even in high focus states.
   Acute shortage of specialist persists.
   Retention of doctors in rural areas still low.
   Renewal of contracts, poor service conditions and increments, high turnover rate, reluctance to send them for longer skill-based training and unnecessary and retrogressive hierarchy between the contractual and the permanent staff are some of the problems.

10. *Wrong reporting:* In many places reports are fake particularly for contraceptive methods, conduction of deliveries and laboratory tests. After implementation of NRHM such wrong report should stop but there is hardly move in this direction. Most of the time it is due to completion of targets which is must for utilization of funds.

11. *Training:* The initiation of NRHM would now start an era of training of different levels of functionaries about the NRHM objectives and

it's components for next 3-5 years and the entire health care staff will be busy in either giving training or receiving training due to large size of the country. It is a Hercules task to recruit ASHAs in next 6 months and train more than 6000 ASHAs every month for next 3 years. There is need of training of trainers for AHSAs training so that refreshers courses can be conducted (Swain S, et al 2008). Availability of public health managers at the district or CHC level is not possible is coming decade and must be given more emphasis on increasing the seats of Postgraduate in Community Medicine or Public Health.

12. During 1997-99, when "*Target Free Approach*" project was initiated similar exercise was conducted. No report of the evaluation of benefits of massive training exercise undertaken is available.
13. India is a land of striking inequalities, more than 70% of its population lives in rural areas, where only 20% of the total hospital beds are located. Yet India is proudly announcing that it is ready to cater to "health tourists" from the developed world. The advances in health care are accessible to only a very small percentage of Indians, with the influx of medical tourists the healthcare inequality is bound to widen. The corporate hospitals are well known for their "poaching" doctors from government and teaching institutions, luring them with huge sums of money, this often paralyzes the government healthcare infrastructure. It is evident from the vacant post in remote areas of India. How can a country allow its doctors who were educated at the Governments expenses, to cater the affluent patients of the developed nations when more than 1300 people die every single day of a completely curable disease like Tuberculosis.
14. Rural Deprived communities: 28% rural people could not have access for treatment because they could not afford. This proportion is 37% for SCs and 32% for STs. These people goes to government facilities than others. Hence poor public health infrastructure hits them hardest. Despite NRHM rural healthcare suffers from the lack of qualified personnel at every level from paramedics to doctors and specialists and requires greater investment in physical infrastructure (TOI 2013, 28th Sept).
14. Urban poor, slum dwellers and tribals are having worse living conditions and suffer more from health problems. One out of four poor in the country is now an urban resident. These groups cannot be left out in any health mission. NRHM should be renamed as National Health Mission. A task force has been constituted to advise the NRHM on strategies for urban health care. If urban component is included under NRHM which would be catering a population of more than 25% then calling this mission as rural mission would not be appropriate.
15. *Total Sanitation Campaign (TSC)* includes IEC activities, rural sanitary marts, individual household toilets, Women sanitary complex and School Sanitation Program.

    Village and Sanitation Committee:

    VHSCs are formed in most of the states but poorly functional. VHSCs seem to have little role in conducting and monitoring VHNDs or advocating expansion of scope of these opportunities. VHSCs, making village health plans is also a concept that has been difficult to recognize. In a study it was found that many of the committees are not conducting awareness campaign and their members are not awared of their role (Singh & Purohit 2012).
16. The NHRM has not advocated for *integration* of Malaria, TB and HIV/AIDS program because they are the part of Millennium Development Goals could be because of favoring international pharmaceutical industries. The cost of medicines for uncomplicated conditions in the open market is about 3-4 times more than what the PHC would have incurred. In case of complications, the state would be spending as much as 30 times more than the cost of primary care at the PHC (Dasgupta & Qadeer 2005). Most recently major public health programs are included in NRHM.
17. Focus on Medical Doctors at Primary Health Centers and Community Health Centers is not given although they are considered as leader of health team. Various initiatives undertaken by central and state governments on placement/ retaining of medical doctors at these centers failed such as *Reorientation of Medical Education* (ROME) scheme, compulsory rural posting, compulsory internship training, etc. Reports indicate that penalty imposed on doctors

in the form of bond money does not worked and doctors ready to pay the bond money rather than joining rural posting after selection or after availing reserved seats meant for rural posting in Meghalaya (TOI 13th July 2007). This is common in other states. The central government is repeatedly threatening to implement compulsory rural posting for every fresh medical graduate. But, we must focus on those issues why doctors refuse to go to rural areas. Those factors need to be removed. Majority of medical doctors do not have vehicle for their disposal for field visits, do not have good residential accommodations, schools and colleges for their children, electricity and water supply, etc. They do not have any incentive for rural posting and de-incentive for not joining rural posting.

18. Funding in National Rural Health Mission is more than funds provided to General Health Services. All services are now directly under control of Bureaucrats/administrators because of that Directorate of Health and Family Welfare feels neglected and poor with resources. There is resentment started building up within the central and state ministries and directorates.
19. Mainstreaming of AYUSH does not mean that Modern System of Medicines are allowed to practice AYUSH or AYUSH practitioners allow to practice modern system with out appropriate qualifications.
20. The control of the funding agencies over the NGOs has potentially dangerous implications for the country. It is entirely possible that a large NGO involved in the implementation of a vital health program, which is funded by USAID or DFID would be more answerable to the embassies of US or Britain than to Health Ministry in New Delhi. Involvement of PATH; an International NGO, in the controversial human papilloma vaccine trials in India, is a case in the point.

SWOT ANALYSIS

Strength

- Strong political commitment.
- Division into high focus and non high focus states.
- Flexible financing and scope for innovation.
- The active involvement of PRIs, community, NGOs and private practitioners is a positive step.
- Over 1,00,000 service providers & more than 8 lakh ASHAs have been added- maximum expansion of human resource.
- IPHS standards- measure for providing optimal health care to the community.
- Mainstreaming of AYUSH
- Some instances of Public Private Partnerships.
- Monitoring & evaluation including external assessments.
- Integration of various health programs.
- Decentralization & evidence based planning.
- Transparency & accountability in the system.
- Strengthened infrastructure.

Weakness

- The selection of ASHA is rigorous and time consuming.
- ASHAs overburdened with work and payments to them delayed. Delegation of work to ASHA by ANMs.
- Acute shortage of skilled manpower including specialists persists.
- Job description is not defined. Most of the ASHA workers are not clear about their role (Saprii L et al 2015)
- No inter-sectoral convergence in DHAP seen.
- Program far from reaching any of its key expected outcomes (barring few).
- Much of the funds are still underutilized. Release of funds still problematic.
- Data collected through HMIS has not been utilized for local action.
- VHSCs & RKS are still in their preliminary phase.
- Public Health expenditure on health is still 1.45% of GDP.
- Lack of drugs and regular logistics supply.
- Neonatal care still lacking.
- Weak supervision.
- No regulation of private sector

Opportunities

- Utilization of AYUSH doctors at PHCs/CHCs/DH
- Involvement of private sector.
- Program management support through recruitment of managers (MBAs), CAs, using IT based system such as e-transfers.
- Proper utilization of second ANM and male MPW so recruited.
- Regular monitoring helps in correcting deviations.

- Availability of funds.
- Increased manpower.
- Era of evidence based medicine

Threats

- Lack of motivation of contractual staff.
- Improper facilities to doctors & paramedics working in rural sector.
- Sustainability of political will of the states & center after 2012.
- No clear agenda of what will happen after 2012.
- Weak quality assurance system.
- Frequent change of the bureaucrats

References

Agarwal S, Sangar K. Need for dedicated focus on urban health within National Rural Health Mission. Ind J Public health 2005; 49(3): 141-151.

Anand T, Kishore J. National Rural Health Mission. Health Positive 2010.

Dasgupta R,Qadeer I. The National Rural Health Mission: A Critical overview. Ind J Public Health 2005; 49 (3): 138-140.

Ghosh J. Deep cuts to India's health spending will delay universal access to healthcare *BMJ 2015; 350 doi:* http://dx.doi.org/10.1136/bmj.h1632

Glass DC, Singer JE. Urban stress. New York: Academic Press: 1972.

Govt. of India. National Rural Health Mission (2005-2012). Ministry of Health & Family Welfare, Govt. of India.

Govt. of India. Accredited Social Health Activist (ASHA) guidelines. Ministry of Health & Family Welfare, Govt. of India.

Govt. of India. Annual Report 2006-2007. Ministry of Health & Family Welfare, Govt. of India 2007.

Govt. of India. Janani Suraksha Yojana. NRHM Ministry of Health and family Welfare Maternal Health Division, Nirman Bhawan Oct. 2006.

Govt. of India. National Rural Health Mission (2005-2012), MOHFW, GOI.

Govt. of India. Report on the Slum population (2001). Census of India, GOI

Haider S, et al. A rapid Appraisal of Sahiya (ASHA) in Jharkhand. Health and Population perspectives and issues 2008; 31 (2): 80-84.

Hospitals (January 2007). Ministry of Health & Family Welfare, GOI.

Indian Public Health Standards (IPHS) for Community Health Centers level; Draft Guidelines; MOHFW, GOI.

IIPS. National Report on Evaluation of functioning of UHPs/ UFWCs in India (2005). Indian Institute of Population Studies.

Indian Public Health Standards (IPHS) For 31 to 50 Bedded Sub-District/Sub-Divisional

International Institute for Population Sciences, NFHS-III, National Fact Sheet, MOHFW, GOI.

Indian Express. India is seriously sick. Indian Express Hyderabad 2006; Jan 24th.

Khan Z, et al. Poor Perinatal care practices in Urban Slum Possible role of social mobilization network. Ind J Com Med 2009; 34: 102-107.

Kishore J, Charu. Mamta Scheme: Public Private Partnership. DMA Bulletin 2008.

Kumar V, Misra SK, Kaushal SK, Gupta SC, Maroof KA. *Janani Suraksha Yojana*: Its utilization and perception among mothers and health care providers in a rural area of North India. Int J Med Public Health 2015;5:165-8.

Malini S, et al. A rapid appraisal on functioning of Janani Suraksha Yojana in South Orissa. Health and Population perspectives and issues 2008; 31 (2): 126-131.

MOHFW. National Health Accounts: India. Ministry of Health & Family Welfare, Govt. of India: New Delhi 2009.

Phadke A. Beyond the Clinic: Uncertain start to National Rural Health Mission. The Time of India 14th April 2005.

Patel V, et al. Assuring health coverage for all in India. Lancet 2015; 386: 2422–35

Planning Commission, Government of India ; Tenth Plan Document (2002-2007, Volume II) Para 6.1.71

Rajalakshmi TK. "Fragile Lives," Frontline, Volume 24 - Issue 05, March, 2007. Available at - www.hinduonnet.com/fline/fl2405/stories/20070323001708900.htm

Registrar General of India, 2006; Report of the Technical group on Population projections 2001-2026.

Saprii L et al. Community health workers in rural India: analysing the opportunities and challenges Accredited Social Health Activists (ASHAs) face in realising their multiple roles. Human Resources for Health (2015) 13:95

Shukla A. National Rural Health Mission-hope or disappointment? India J Public Health 2005; 49 (3): 1267-132.

Singh R, Purohit B. Limitation inthe functioning of village health and Sanitation committees in a north western state in India. Int J Medicine and Public Health 2012; 2(3): 39-46.

Stokols D. A typology of crowding experiences. In: Baum A, Epstein Y. Ed. Human Response to crowding. Hill Sadale NJ: Erlbaum 1978.Suvarna Devi P. [se-mch] QUERY: Janani Suraksha Yojana (JSY) - Impact and Gaps in Implementation. Experiences; Examples. Reply by 14 August 2009.

Swain S, et al. A rapid Appraisal of Functioning of ASHA under NRHM Orissa. Health and Population perspectives and issues 2008; 31 (2): 73-79.

Times of India. Will National Rural Health Mission take off. Times of India 2006; Jan 8:9.

Trivedi et al. Rapid urbanization-its impact on mental health: A south Asian perspective. Ind J Psychiatry 2008; 50 (3): 161-165.

UNFPA. State of world Population 2007. www.unfpa.org/swp/2007

World Bank. India Raising the Sights: Better Health Systems for India's Poor Overview (November 3, 2001). The World Bank Report.

WHO. Opportunities for global health initiatives with health system action agenda. Geneva (WHO 2005) making health system work, working paper 4).

CHAPTER 7

NATIONAL URBAN HEALTH MISSION

Urbanization and Public Health

Humans for the first time going to live more in cities than in rural areas according to the State of the World Population Fund (UNFPA 2007). The vast majority of these new urban dwellers will live in developing countries and they will be poor. Cities offer the lure of better employment, education, health care, and culture; and they contribute disproportionately to national economies. However, rapid and often unplanned urban growth is often associated with poverty, environmental degradation, and population demands that outstrip service capacity. These conditions place human health at risk.

A range of urban hazards are associated health risks. Substandard housing, crowding, air pollution, insufficient or contaminated drinking water, inadequate sanitation and solid waste disposal services, industrial waste, increased motor vehicle traffic, poverty and unemployment are linked with vector borne diseases, tuberculosis, mental disorders, cardiovascular diseases and diabetes. Rapid urbanization are exceeding human capabilities to live under conditions of security and mutual support and concern. Some feel the sheer scale of urban life is forcing individual identity to yield to anonymity, indifference, and narrow self-interest.

The range of disorders and deviancies associated with urbanization is enormous and includes psychoses, depression, sociopathy, substance abuse, alcoholism, crime, delinquency, vandalism, family disintegration, and alienation. Such negative impact often results in unreasonable means which may result in communal violence (Glass & Singer 1972). Negative impact us also experienced by behavior constraints practiced or imposed upon the urban people. If behavior is unduly suppressive, it may result in learned helplessness leading to stress-related disorders (Stokols 1978). Conflicts, wars (e.g. in Afganistan), and civil strife (e.g. in Pakistan and Myanmar) in the deprived countries cause higher rates of mental health problems such as post traumatic stress disorders, anxiety and depressive disorders (Trivedi et al 2008). There is a need of sound mental health policy to handle such health transition.

India

As per Census 2001, 28.6 crores people live in urban areas. The urban population is estimated to increase to 35.7 crores in 2011 and to 43.2 crores in 2021. Urban growth has led to rapid increase in number of urban poor population, many of whom live in slums and other squatter settlements. As per Census 2001, 4.26 crores people lived in slums spread over 640 towns/ cities having population of fifty thousand or above. In the cities with population one lakh and above, the 3.73 crores slum population is expected to reach 6.25 crores by 2008, thus putting greater strain on the Despite close proximity of the urban poor to urban health facilities their access to them is severely restricted. This is on account of their being "crowded out" because of the inadequacy of the urban public health delivery system. Ineffective outreach and weak referral system also limits the access of urban poor to

health care services. The social exclusion and lack of information and assistance at the secondary and tertiary hospitals makes them unfamiliar to the modern environment of hospitals, thus restricting their access. The lack of economic resources inhibits/ restricts their access to the available private facilities. Further, the lack of standards and norms for the urban health delivery system, when contrasted with the rural network, makes the urban poor more vulnerable and worse off than their rural counterpart.

This situation is further worsened by the fact that a large number of urban poor are living in slums that have an "illegal status". The "illegal status" compromises the entitlement of the slum dweller to basic services. Slum populations, obviously, face greater health hazards due to over crowding, poor sanitation, lack of access to safe drinking water and environmental pollution.

The above situation is reflected in the poor health indicators. As per the reanalysis of the NFHS III data (Table 6.1), Under 5 Mortality Rate (U5MR) among the urban poor is at 72.7, significantly higher than the urban average of 51.9. About 47.1% of urban poor children under-three years are underweight as compared to the urban average of 32.8% and 45% among rural population. Among the urban poor, 71.4% of the children are anemic as against 62.9% in the case of urban average. 60% of the urban poor children miss complete immunization as compared to the urban average of 42%. Only 18.5% of urban poor households have access to piped water supply at home as compared to the urban average of 50%. Among the urban poor, 46.8% women have received no education as compared to 19.3% in urban average statistics. Among the urban poor only 44 % of deliveries are institutional as compared to the urban average of 67.5%.

Despite availability of government and private hospitals the urban poor prefer home deliveries. Expensive private healthcare facilities, perceived unfriendly treatment at government hospitals, emotionally securer environment at home, and non-availability of caretakers for other siblings in the event of hospitalization are some of the reasons for this preference.

Poor environmental condition in the slums along with high population density makes the urban poor vulnerable to lung diseases like COPD, Asthma, and Tuberculosis (TB) etc. Slums also have a high incidence of vector borne diseases (VBDs) and cases of malaria among the urban poor are twice as in the case of other urbanites. Open sewers, poorly built septic tanks, stagnant water both inside and outside the house serve as ideal breeding ground for insects. According to National Commission on Macroeconomics and Health (NCMH) report, cases of coronary heart disease in the urban areas will continue to rise and will be higher as compared to rural areas, similarly the load of diabetes cases in India will rise from 2.6 crores in 2000 to 4.6 crores by 2015 particularly concentrated in urban areas. Heterogeneity among slum dwellers caused by an influx of migrants from different areas, varied cultures and backgrounds, existence of fewer extended family connections, engagement and preoccupation of more women in work leads to lesser willingness and fewer occasions that can enable the slum community as a strong collective unit.

The traditional temporary migration of pregnant women for delivery results in their missing out on services at either of the residences. The mother and the infant do not receive services in the village due to non-availability of previous record of services received.

There are particular occupations such as rickshaw pullers, rag pickers, sex workers, and other urban poor categories like beggars and destitutes, construction workers, street children who are also a highly vulnerable group especially at greater risk to RTI/STI and HIV/AIDS.

Therefore there is need of the National Urban Health Mission to address the health concerns of the urban poor by facilitating equitable access to available health facilities by rationalizing and strengthening of the existing capacity of health delivery for improving the health status of the urban poor.

Goal

To improve the health status of the urban poor particularly the slum dwellers and other disadvantaged sections, by facilitating equitable access to quality health care through a revamped public health system, partnerships, community based risk pooling and

Table 7.1: Key findings of NFHS 3

Key Indicators for Urban Poor in India from NFHS-3 and NFHS-2	Urban Poor	Urban Non-Poor	Overall Urban	Overall Rural	All India	Urban Poor (NFHS-2)
Marriage and Fertility						
Women age 20-24 married by age 18 (%)	51.5	21.2	28.1	52.5	44.5	63.9
Women age 20-24 who became mothers before age 18 (%)	25.9	8.3	12.3	26.3	21.7	39.0
Total fertility rate (children per woman)	2.80	1.84	2.06	2.98	2.68	3.78
Higher order births (3+ births) (%)	28.6	11.4	16.3	28.1	25.1	29.5
Birth Interval (median number of months between current and previous birth)	29.0	33.0	32.0	30.6	31.1	31.0
Maternal Health						
Maternity care[1]						
Mothers who had at least 3 antenatal care visits (%)	54.3	83.1	74.7	43.7	52.0	49.6
Mothers who consumed IFA for 90 days or more (%)	18.5	41.9	34.9	18.8	23.1	47.0[6]
Mothers who received tetanus toxoid vaccines (minimum of 2) [3]	75.8	90.7	86.4	72.6	76.3	70.0
Mothers who received complete ANC[2] (%)	11.0	29.5	23.7	10.2	15.0	19.7
Births in health facilities (%)	44.0	78.5	67.4	28.9	38.6	43.5
Births assisted by a doctor/nurse/LHV/ANM/other health personnel (%)	50.7	84.2	73.4	37.4	46.6	53.3
Anaemia among women						
Women age 15-49 with anaemia (%)	58.8	45.3	50.9	57.4	55.3	54.7
Child Health & Survival						
Child immunization and vitamin A supplementation[3]						
Children completely immunized (%)	39.9	65.4	57.6	38.6	43.5	40.3
Children receiving measles immunization (%)	52.6	80.1	71.8	54.2	58.8	35.3
Children left out from UIP (Children not receiving DPT 1) (%)	29.5	9.8	15.6	27.0	24.0	35.0
Children dropping out from UIP (DPT 1 to DPT 3) (%)	19.1	13.2	15.3	22.6	20.7	21.2
Child feeding practices						
Children under 3 years breastfed within one hour of	27.3	31.5	30.3	22.4	24.5	17.7
Total unmet need (%)	14.1	8.3	10.0	14.6	13.2	16.7
a. For spacing (%)	5.7	4.1	4.5	6.9	6.2	8.5
b. For limiting (%)	8.4	4.2	5.2	7.2	6.6	8.2
Environmental Conditions						
Households with access to piped water supply at home (%)	18.5	62.2	50.7	11.8	24.5	13.2
Households accessing public tap / hand pump for drinking water (%)	72.4	30.7	41.6	69.3	42.0	72.4
Household using a sanitary facility for the disposal of excreta (flush / pit toilet) (%)	47.2	95.9	83.2	26.0	44.7	40.5
Median number of household members per sleeping room	4.0	3.0	3.3	4.0	3.5	3.5
Infectious Diseases						
Prevalence of medically treated TB (per 100,000 persons)	461	268	307	469	418	535
Women (age 15-49) who have heard of AIDS	59.2	83.0	76.1	62.9	66.4	61.4
Prevalence of HIV among adult population (age 15-49)	0.47	0.31	0.35	0.25	0.28	na
Educational Attainment and Schooling						
School attendance 6-17 years (male) (%)	61.3	83.7	77.1	74.7	75.4	67.3
School attendance 6-17 years (female) (%)	59.2	83	76.1	62.9	66.4	61.4
Women age 15-49 with no education (%)	46.8	12.7	22.0	49.7	40.6	60.9
Access to Health Service						
Children under age six living in enumeration areas covered by an AWC (%)	53.3	49.1	50.4	91.6	81.1	Na
Women who had at least one contact with a health worker in the last three months (%)	10.1	5.8	6.8	14.2	11.8	16.7[5]

na: not available

1. For the most recent live birth; 2. Complete ANC includes three ANC visits, two TT injections and 90 doses of IFA; 3. For the last 2 births before the survey within the age group of 12-23 months; 4. For children under age of five years; 5. Rates are calculated for the five-year period preceding the survey
#NFHS 2 figure is for 'women who received 90+ IFA' @ NFHS 2 figure is for 'children under three years' $ NFHS 2 figure is for 'women who receive visit of a health/ family planning worker in the 12 months prior to the survey'
NFHS-III data re-analysis done by UrHRC

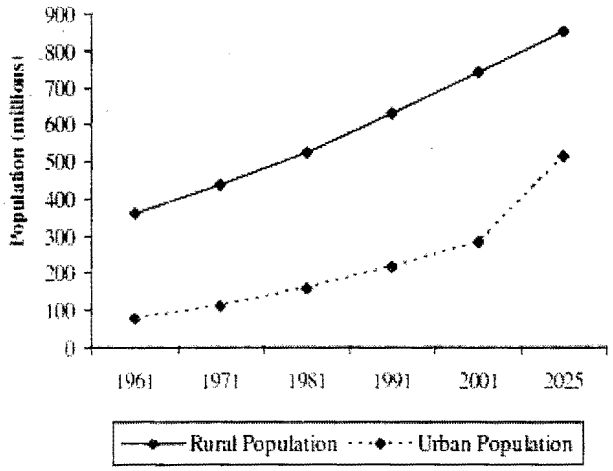
insurance mechanism with the active involvement of the urban local bodies.

Core Strategies

The following strategies are envisaged:

(i) Improving the efficiency of public health system in the cities by strengthening, revamping and rationalizing urban primary health structure

The situational analysis has clearly revealed that most of the existing primary health facilities, namely, the Urban Health Centers (UHCs) /Urban Family Welfare Centers (UFWC)/ Dispensaries are functioning sub-



optimally due to problems of infrastructure, human resources, referrals, diagnostics, case load, spatial distribution, and inconvenient working hours. The NUHM therefore proposes to strengthen and revamp the existing facilities into **a "Primary Urban Health Center"** with **outreach** and **referral facilities**, to be functional for every 50,000 population on an average, however it can be for 5000 population in sparsely populated areas and 75000 in densely populated areas.

(ii) Partnership with non-government providers for filling up of the health delivery gaps:

Non-government providers are more accessible for general and specialized services by the urban poor. It is thus proposed to forge partnership with this sector to promote active community participation and ownership.

(iii) Promotion of access to improved health care at household level through community based groups: Mahila Arogya Samiti

Community based groups such as 'Mahila Bachat Gat' scheme in Maharashtra and urban health initiatives in Indore and Agra have demonstrated the efficacy of women led thrift/self help groups in meeting urgent cash needs in times of health emergency and also empowering them to demand improved health services. There is a need to utilize services created under the Swarna Jayanti Shahari Rojgar Yojana (SJSRY), a scheme of the Ministry of Urban Development, which seeks to provide employment to the urban poor. Under the Urban Self Employment Program (USEP) of the scheme there are provisions for Development of Women and Children in Urban Areas (DWCUA) groups of at least 10 urban poor women and Thrift Credit Groups (TCG), which may be set up by groups of women. *Mahila Arogya Samiti*, (MAS) a community based federated group of around 20 to 100 households, depending upon the size and concentration of the slum population, with flexibility for state level adjustments, and be responsible for health and hygiene behavior change promotion and facilitating community risk pooling mechanism in their coverage area. The Accredited Social Health Activist (ASHA) may provide the leadership and promote the *Mahila Arogya Samiti*. The ASHA may be preferably co-located with the Anganwadi Centers located in the slums for optimization of health outcomes. Each of the MAS may have 5-20 members with an elected Chairperson/ Secretary and other elected representative like Treasurer. The mobilization of the MAS may also be facilitated by a contracted agency/ NGO, working along with the USHA responsible for the area.

(iv) Strengthening public health through preventive and promotive action

The USHA, in coordination with the members of the MAS would promote proactive community action in partnership with the urban local bodies for improved water and environmental sanitation, nutrition and other aspects having a bearing on health.

(v) Increased access to health care through risk pooling and community health insurance models

The urban poor incur high out-of pocket expenditure often leading to indebtedness and impoverishment. To mitigate this risk, it is proposed to encourage *Mahila Arogya Samitis* to save their resources for urgent health needs. NUHM also proposes to promote Community based Health Insurance models to meet costs arising out of hospitalization and critical illnesses.

(vi) IT enabled services (ITES) and e- governance for improving access improved surveillance and monitoring

The availability of ITES in the urban areas makes it a useful tool for effective tracking, monitoring and timely intervention for the urban poor. The NUHM would provide software and hardware support for developing web based HMIS for quick transfer of data and required action. The States would also be encouraged

to develop strategies for affecting an urban disease surveillance system and a plan for rapid response in times of disasters and outbreaks. It is envisioned that the GIS system envisioned would be integrated into a system of reporting alerts and incidence of diseases on a regular basis. This system would also be synchronized with the IDSP surveillance system.

(vii) Capacity building of stakeholders

For effective utilization for quality care there is a need to build managerial, technical and public health competencies among the health care providers and the ULBs through capacity building, monetary and nonmonetary incentives, and managerial support.

(viii) Prioritizing the most vulnerable amongst the poor

Under the NUHM special emphasis would be on improving the reach of health care services to homeless and disadvantage groups such as destitute, beggars, street children, construction workers, coolies, rickshaw pullers, sex workers, street vendors and other such migrant workers and 10% of the city budget for be allocated for them.

(ix) Ensuring quality health care services

To ensure quality health services following measures are required:

a) defining Indian Public Health Standards suitably modified for urban areas wherever required
b) defining parameters for empanelment/regulation/ accreditation of non-government providers,
c) developing capacity of public and private providers for providing quality health care,
d) encouraging the acceptance and enforcement of local public health acts
e) ensuring citizen charters in facilities
f) encouraging development of standard treatment protocols.

Targets

National Urban Health Mission is expected to achieve the following targets in urban areas:

- IMR reduced to 30/1000 live births by 2012.
- Maternal Mortality reduced to 100/100,000 live births by 2012.
- TFR reduced to 2.1 by 2012.
- Malaria mortality reduction rate-50% by 2010, additional 10% by 2012.
- Kala-Azar mortality reduction rate-100% by 2010 and sustaining elimination thereafter.
- Filaria reduction rate-70% by 2010, 80% by 2012 and elimination by 2015.
- Dengue mortality reduction rate-50% by 2010 and sustaining it at that level till 2012.
- Japanese encephalitis mortality reduction rate-50% by 2010 and sustaining it at the level till 2012.
- Dengue Mortality Reduction Rate - 50% by 2010 and sustaining at that level.
- Chikungunya: Reduction in number of outbreaks and morbidity due to Chikungunya by prevention and control strategy
- Leprosy Prevalence Rate –reduced from 1.8 per 10,000 in 2005 to less than 1 per 10,000 thereafter.
- Tuberculosis DOTS series - maintain 85% cure rate through the entire Mission Period and also sustain planned case detection rate.
- Reduce the prevalence of deafness by 25% (from existing levels) by 2012

Measurable Indicators of improved health of the urban poor at the City Level is also proposed to be assessed annually through e- enabled HMIS and surveys. Some of the measurable indicators are given below:

- Cities/population with all slums and facilities mapped
- Number cities/population where Mission has been initiated
- Increase in OPD attendance
- Increase in BPL referrals from UHCs
- Increase in BPL referrals availed at referral units
- Number of Slum/ Cluster level Health and Sanitation Day
- Number of USHA receiving full honorarium
- Number of MAS formed
- Number of UHCs with Program Manager
- Increase in ANC check-up of pregnant women
- Increased Tetanus toxoid (2nd dose) coverage among pregnant women
- Increase in institutional deliveries as percentage of total deliveries
- Increase in complete immunization among children < 12months
- Increase in case detection for malaria through blood examination
- Increase in case detection of TB through identification of chest symptomatic
- Increase in referral for sputum microscopy examination for TB

- Increase in number of cases screened and treated for dental ailments
- Increase in number of cases screened for diabetes at UHCs
- Increase in number of cases referred and operated for heart related ailments
- Increase in first aid and referral of burns and injury cases
- Increase in number of mental health services at primary health care level in urban health settings.
- Increase in the awareness of community about tobacco products/alcohol and substance abuse.

Components of UHM

1. Planning & Mapping
2. Program Management
3. Outreach Services
4. Primary Urban Health Center (PUHC)
5. Referrals
6. Capacity Building, Training & Orientation
7. Community Risk Pooling/Insurance
8. Public Private Partnership (PPP)
9. Monitoring & Evaluation (including ITES)
10. Special Program for Vulnerable Groups
11. Support for city level public health action
12. Additional Support for National Health Programs

Urban Health Delivery Model

The diagram describes the components of the proposed urban health service delivery model (figure 6.1).

The urban health delivery model would basically comprise of an Urban Health Center for provision of primary health care with outreach and referral linkages as elucidated below:

(a) Community level

• Accredited Social Health Activist (ASHA)

Each slum/community would have a well defined grass root level area covering about 1000-2,500 beneficiaries, between 200-500 households, preferably co-located at the Anganwadi Center functional at the slum level, for delivery of services at the door steps. One frontline community worker called ASHA on the lines of ASHA under NRHM would remain in charge of each area and serve as an effective and demand–generating link between the health facility (Primary Urban Health Center) and the urban slum populations. She would maintain interpersonal communication with the beneficiary families and the Mahila Arogya Samitis for which they are earmarked.

The ASHA would preferably be a woman resident of the slum–married/widowed/ divorced, preferably in the age group of 25 to 45 years. She should also be a literate woman with formal education up to class eight which may be relaxed only if no suitable person with this qualification is available. She would be chosen

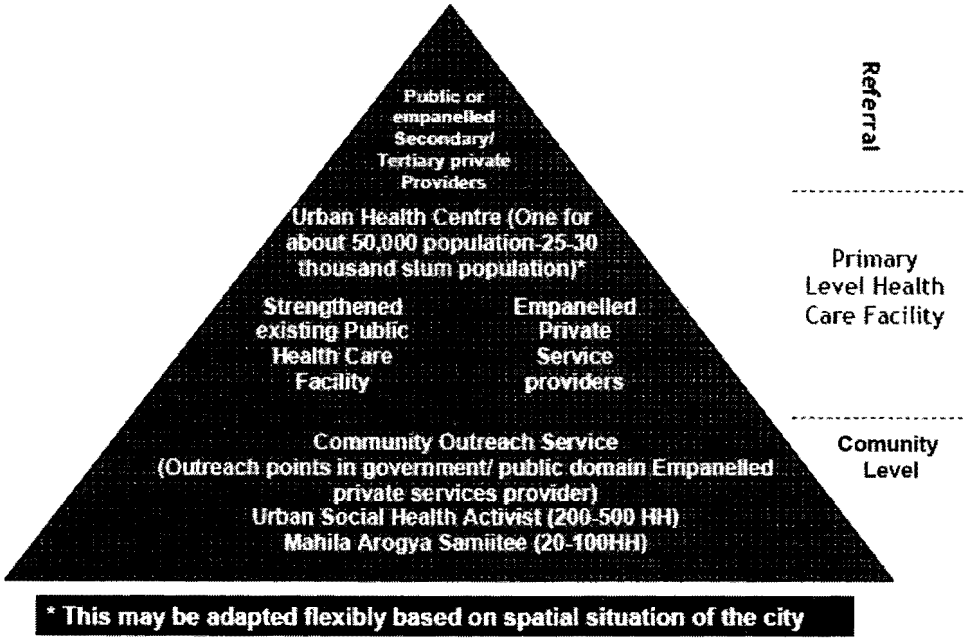

Public or empanelled Secondary/ Tertiary private Providers
Urban Health Centre (One for about 50,000 population-25-30 thousand slum population)*
Strengthened existing Public Health Care Facility
Empanelled Private Service providers
Community Outreach Service
(Outreach points in government/ public domain Empanelled private services provider)
Urban Social Health Activist (200-500 HH)
Mahila Arogya Samiitee (20-100HH)
* This may be adapted flexibly based on spatial situation of the city
Referral
Primary Level Health Care Facility
Comunity Level

Figure 7.1: Urban health service delivery model

through a rigorous community driven process involving Urban Local Body (ULB) Counselors, community groups, self-help groups, Anganwadis, ANMs. A team of five facilitators may be identified in each UHC catchment area with the help of an NGO, through a consultative process, for facilitating the selection of the USHA. The facilitators would preferably be women from local NGOs; community based groups, Anganwadis or Civil Society Institutions. In case none of these is available in the area, the officers of other Departments at the slum level/local school teachers may be taken as facilitators. Preferably some suitable identified place for ASHA may be arranged in the slums which may be AWW centers, clubs, community premises set up under the Jawaharlal Nehru National Urban Renewable Mission (JNNURM), Sub Health Posts set up in India Pouplation Project (IPP) cities, municipal premises etc, or even her own residence. A USHA monitoring system on the lines of NRHM may be put in place involving dedicated community level volunteers/professionals preferably through the local NGO at the PUHC level, for supporting and coordinating the activities of the ASHA. The states may also consider the option of Community Organizer for 10 USHA for more effective coordination and monitoring, preferably located at the monitoring NGO. The Community organizer along with the ANM may be designated as the monitoring and management team at the slum level for the USHAs.

The essential services to be rendered by the ASHA may be as follows:

- Active promoter of good health practices and enjoying community support.
- Facilitate awareness on essential RCH services, sexuality, and gender equality age at marriage/ pregnancy. Motivation on contraception adoption, medical termination of pregnancy, sterilization, spacing methods. Distribution of condoms and oral contraceptive Pills. Early restriction of pregnancies, pregnancy care, clean and safe delivery, nutritional care during pregnancy, identification of danger signs during pregnancy. Counseling on immunization, ANC, PNC etc. They act as a depot holder for essential provisions like Oral Rehydration Salt (ORS), Iron Folic Acid Tablet (IFA), chloroquine, Oral Pills & Condoms, etc. Identification of target beneficiaries and support the ANM in conducting regular monthly outreach sessions and tracking service coverage.
- Facilitate access to health related services available at the Anganwadi/Primary Urban Health Centers/ULBs, and other services being provided by the ULB/State/ Central Government.
- Formation and promotion of Mahila Arogya Samiti in her community.
- Arrange escort/accompany pregnant women and children requiring treatment to the nearest Primary Urban Health Center, secondary/tertiary level health care facility.
- Reinforcement of community action for immunization, prevention of water borne and other communicable diseases like TB (DOTS), Malaria, Chikungunya and Japanese Encephalitis.
- Carrying out preventive and promotive health activities with AWW/ *Mahila Arogya Samiti.*
- Maintenance of necessary information and records about births & deaths, immunization, antenatal services in her assigned locality as also about any unusual health problem or disease outbreak in the slum and share it with the ANM in charge of the area.
- Provision for a minimum package of curative care empowered with minimum knowledge for timely referrals equipped with an ASHA like drug kit. In return for the services rendered, she would receive a performance-based incentive.

During the field visits it was observed that provision of a photo identity card to the USHAs greatly boosts their self esteem. The states/cities can also explore the option of providing USHAs with Photo ID card.

Mahila Arogya Samiti (MAS) – acts as community based peer education group, involved in community monitoring and referral. The MAS may consist of 20-100 households (HH) with an elected Chairperson and a Treasurer, supported by an ASHA. This group would focus on preventive and promotive care, facilitating access to identified facilities, risk pooling fund and health insurance.

ANM – Providing preventive and promotive healthcare services at the household level through regular visits and outreach sessions. Each ANM will organize a minimum of one outreach session in the coverage population of the ASHA. Four ANMs will be posted in each UHC. For this purpose a revolving fund would be kept with the ANM at the PUHC, which would be

replenished from time to time.

- *Outreach Medical Camps* – Once in a month the MO would accompany the ANMs to the outreach sessions (may be called Outreach camps). It will include OPD (consultation), basic lab investigations (using mobile/disposable kits), and drug dispensing, apart from counseling. Each camp will be covering a responsibility area of two ANMs working in a UHC. The UHC can also partner with local General Practitioner for the camp.
- All arrangements and staff would be contractual with no permanent liability to Government of India.

The following performance based incentive package is suggested subject to modifications by the State:

	Activity	*Proposed Incentive per month (Rs)*
1	Organization of outreach sessions	200
2	Organization of monthly meeting of MAS	100
3	Attend monthly meeting at UHC	200
4	Organize Health & Nutrition day in collaboration with AWW	100
5	Organize community meeting for strengthening preventive and promotive aspects	50 per meeting (200 upper limit)
6	Provide support to Baseline survey and filling up of family Health Register	5 per Household (once a year)
7	Maintain records as per the desired norms like Household Registers, Meeting Minutes, Outreach Camps registers	50 per month
8	Additional Immunization incentives for achieving complete immunization in among the children in her area of responsibility	5 per child
9.	Incentives/compensation in built in national schemes for ASHA under JSY, RNTCP, NVBDCP, Sterilization etc. any other National program. Similar norms would be applicable for USHA.	*

** The respective program would be requested to issue necessary instructions in this regard.*

(b) Primary Urban Health Center

Generally one Urban Health Center (UHC) is for approximately 50,000. It should be located preferably within a slum or a half-kilometer radius. If it is in slum it can be for population of approximately 20000-30000, with provision for evening OPD also. The cities, based upon the local situation may establish a UHC for 75,000 for areas with very high density and can also establish one for around 5000-10,000 if there are isolated slum clusters or disadvantage group.

It will act as first point for curative healthcare. The services provided in UHC will include OPD (consultation), basic lab diagnosis, drug /contraceptive dispensing, apart from distribution of health education material and counseling for all communicable and noncommunicable diseases. In order to ensure access to the urban slum population at convenient timings, the UHC may provide services for 4 hrs in the morning and 2 hrs in the evening. For provision of certain services evening OPD if required, partnership with local General Practitioners through benchmark performance indicators may also be explored. It will ordinarily not include inpatient care.

It will staff by a 1 Doctor, 1 lab technician 1 pharmacist, 2 staff nurses, up to 4 ANMs (depending upon the population covered), apart from clerical and support staff (peons, sweepers etc) and one Program Manager/Community mobilization officer for monitoring community mobilization, capacity building efforts and strengthening the referrals.

The option of co-locating the AYUSH center with UHC may also be explored, thus enabling the placement of AYUSH doctor and other AYUSH paramedic staff in the UHC. The NUHM would provide support to the existing government health facilities in the urban areas (UHP, UFWC, and Dispensaries etc) as required for strengthening them to PUHC standard. Where there is nonfunctional government health facility, required staff may be posted from medical/paramedical/nursing colleges/ state government (on deputation). Alternatively, contractual appointments from the private market may be made to staff such facilities. Where there are no government health facilities, existing private clinics/ nursing homes operating in or near the slum clusters may be empaneled/accredited and designated as PUHCs.

The government facilities strengthened as PUHC will also be provided annual financial support in the form of Rogi Kalyan Samiti/ Hospital Management Committee Fund of Rs. 50,000 per UHC per year, with the amount being proportional to the population covered (@ Re.1.00 per head, i.e. a PUHC covering

40,000 population will get Rs.40, 000 and a PUHC covering 75,000 population will be getting Rs. 75,000 per year).

All engagements would be contractual with no permanent liability to Government of India.

(c) Referral Units

Existing hospitals, including maternity homes, state government hospitals and medical colleges, apart from private hospitals will be empaneled /accredited to act as referral points for different types of healthcare services like maternal health, child health, diabetes, trauma care, orthopedic complications, dental surgeries, mental health, critical illness, deafness control, cancer management, tobacco counseling / cessation, critical illness, surgical cases etc. The empaneled/accredited facilities would be reimbursed for the services provided as per the pre-decided rates.

The referral services will be cash-free for the beneficiary and will be financed by community health insurance or voucher scheme as per the PIP developed for the city. Collaboration with local Medical Colleges may be promoted for strengthening the training support and supplement human resource at the PUHC level. All engagements would be contractual with no permanent liability to Government of India.

MAMTA Scheme

An example of Public Private Partnership in Health Care

India suffers from high maternal and neonatal mortality. One of the reasons of this high mortality is home delivery conducted by untrained personnel. In Delhi, approximately 3.2 lakh deliveries take place every year and 63% (as per NFHS 3 survey report, 2005) of these are institutional deliveries and in some areas there are much lower rates of institutional deliveries. Government of NCT of Delhi is committed to provide equitable, quality healthcare for its citizens especially, the maternal and child segment of its population. An important component of healthcare aimed at reducing the Maternal and Infant Mortality is provision of "Institutional Delivery" for pregnant women. The Government is trying to universalize institutional deliveries. However, there are constraints like lack of adequate Government health facilities equipped and functional to provide the comprehensive obstetric services for the mother and the newborn and overburdened Government hospitals. Therefore, PPP model was chosen wherein Private Hospitals were approached to express their intention to join the Mamta scheme. For comprehensive care, which includes Antenatal care, institutional delivery, new born care and postnatal care, the hospital is being given Rs. 4000/- by the district societies however, these are part packages also, wherein for institutional deliveries alone Rs. 3000/- is given. If only Antenatal care is provided Rs. 2000/- is given (Kishore & Charu 2008).

Healthcare Services for the beneficiary under the Scheme:

a. At least three antenatal checkups with all necessary investigations including two ultrasound examinations of pregnant woman (14-18 wks and 32-36 wks) registered under the scheme.
b. Provision of Injection TT and Iron Folic Acid Tablets to all pregnant women as per RCH Schedule, Provision of institutional delivery facilities, including emergency obstetric care to all registered pregnant women and essential new born care to the new born including administration of birth doses of vaccines to newborns. If necessary blood transfusion, cesarean section, ICU, essential newborn care, and resuscitation should also be covered.
c. One postnatal checkup within first week of delivery but not later than 14 days.

Eligibility Criteria for beneficiaries under the scheme

a. The pregnant woman must belong to the BPL / SC / ST Category and should be a resident of Delhi.
b. The pregnant woman should not be less than 19 years of age.
c. The pregnant woman should not have more than one living child.

Registration of beneficiaries under the scheme:

The pregnant woman shall be enrolled under MAMTA only after production of the following documents:

a. Proof of age: - Ration Card / School Certificate / Birth Certificate / Affidavit / any other relevant document/ clinical assessment of the attending doctor in absence of any other proof. Proof that

she is a resident of Delhi. (Ration Card / Election I-Card / Any other document indicating specific address).

b. Affidavit regarding number of living children.
c. Registration of pregnant women will be preferably done in the first trimester (12 weeks).
d. BPL Card / Certification of BPL Status from the SDM / Certificate of SC / ST issued by competent authority.

Other Benefits

The woman delivering under MAMTA scheme is also be entitled for cash incentive of Rs. 600/- available under Janani Suraksha Yojana. If woman under the MAMTA scheme delivers a girl child then the girl child is be entitled to receive benefits under 'Ladli Scheme', a scheme of Dir. of social welfare, Govt NCT of Delhi.

Financial package to nursing home/ private hospital

Rs. 4000/- will be provided to the private hospital providing comprehensive care to pregnant woman which includes Antenatal care, institutional delivery, new born care and post natal care. There are part packages also for only institutional delivery where by Nursing home will be given Rs. 3000/- only and if only Antenatal care is given then Rs. 2000/- will be given to nursing home.

SWOT ANALYSIS

Strengths

- NUHM rightly focuses on the urban poor particularly the slum dwellers and other disadvantaged sections.
- Special emphasis would be on improving the health care services to those vulnerable among the urban poor, like the destitutes, beggars, street children, construction workers etc.
- NUHM would improve the efficiency of the existing system by making provisions for need based contractual human resources, equipments and drugs.
- The provision of health care delivery with the help of outreach sessions in the slums would also strengthen the delivery of health care services.
- NUHM also focuses on strengthening promotive action for improved health and nutrition and prevention of diseases.
- NUHM also proposes to promote Community risk pooling and Community based Health Insurance models to meet costs arising out of hospitalization and critical illnesses for urban poor.
- NUHM also proposes to build managerial, technical and public health competencies among the health care providers and the ULBs through capacity building, monetary and nonmonetary incentives and managerial support.
- NUHM would aim to ensure quality health services.
- Indian Public Health Standards (IPHS) are already framed for PUHC but still need to be developed for outreached activities.
- Defining parameters for empanelment/regulation/ accreditation of non-government providers.
- Developing capacity of public and private providers for providing quality health care.
- Encouraging the acceptance and enforcement of local public health acts.
- Ensuring citizens charter in facilities.
- Encouraging development of standard treatment protocols.

Weaknesses –

- NUHM provides no information on how the USHAs would be trained and the numbers to be recruited.
- NUHM provides no time-limits to carry out its activities but targets are set. POPs for states are not framed.
- NUHM provides no information on how the multiple health agencies in Delhi like MCD, NDMC, Delhi Cantonment Board, ESI Corporation, Delhi Govt etc would be coordinated.

Opportunities -

- Provision of Rogi Kalyan Samiti is being made for promoting local action.
- It is proposed to forge partnership with non-government sector to improve access to curative care and to promote active community participation and ownership.
- It is proposed to promote community based groups (Mahila Arogya Samitis) for enhanced community participation and empowerment.
- The availability of ITES in the urban areas makes

it a useful tool for effective tracking and monitoring of the diseases and timely intervention for the urban poor.

- The Ministry is using Geographical Information Systems (GIS), which use satellite-based technology, to map the slums accurately.

Threats

- National Urban Health Mission (NUHM), has become a casualty of a bureaucratic logjam and inter-ministry turf issues.
- NUHM which was originally scheduled for an April'08 launch and then in October 08. This scheme is overlapping other schemes such as the Rashtriya Swasthya Bima Yojana and the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) in certain issues.
- One example of overlaps between the government schemes is the ministry of labor and employment's Rashtriya Swasthya Bima Yojana, a health insurance scheme for the so-called below poverty line (BPL) sections of the population.
- Under its plan, NUHM, too, gives provisions for health insurance for urban poor through "Family Health Suraksha" cards under the Community Health Insurance model.
- A second instance is the significant overlap in coverage of cities and services that JNNURM, administered by the ministry of urban employment and poverty alleviation, has with NUHM
- The former has identified 63 cities — based on population, historical or tourist importance — to provide or upgrade civic amenities such as sanitation, health, environmental improvement of slums, urban renewal and transportation.
- Some of the cities identified under NUHM — the health ministry plans to launch the program in 100 cities in the first year out of the 427 cities it wants to cover — and JNNURM are common
- The health ministry initiative also envisages urban health centres — one for every 50,000 people — and that may now have to be embedded in the health facilities being planned under the urban ministry's project in order to avoid duplication of work.
- Another factor delaying NUHM is that as much as half of the urban slums in the country, the health ministry found in its surveys, are not notified and, therefore, could fall out of the purview of NUHM.
- Funding in Urban Health Mission is more than general Health Services and directly controlled by Bureaucrats/administrators because of that Directorate of Health and Family Welfare feel neglected and poor with resources.

References

Agarwal S, Sangar K. Need for dedicated focus on urban health within National Rural Health Mission. Ind J Public health 2005; 49(3): 141-151.

Ghosh J. Deep cuts to India's health spending will delay universal access to healthcare *BMJ 2015; 350 doi:* http://dx.doi.org/10.1136/bmj.h1632

Glass DC, Singer JE. Urban stress. New York: Academic Press: 1972.

Govt. of India. Report on the Slum population (2001). Census of India, GOI

IIPS. National Report on Evaluation of functioning of UHPs/UFWCs in India (2005). Indian Institute of Population Studies.

International Institute for Population Sciences, NFHS-III, National Fact Sheet, MOHFW, GOI.

Khan Z, et al. Poor Perinatal care practices in Urban Slum Possible role of social mobilization network. Ind J Com Med 2009; 34: 102-107.

Kishore J, Charu. Mamta Scheme: Public Private Partnership. DMA Bulletin 2008.

MOHFW. National Health Accounts: India. Ministry of Health & Family Welfare, Govt. of India: New Delhi 2009.

Planning Commission, Government of India ; Tenth Plan Document (2002-2007, Volume II) Para 6.1.71

Rajalakshmi TK. "Fragile Lives," Frontline, Volume 24 - Issue 05, March, 2007. Available at - www.hinduonnet.com/fline/fl2405/stories/20070323001708900.htm

Stokols D. A typology of crowding experiences. In: Baum A, Epstein Y. Ed. Human Response to crowding. Hill Sadale NJ: Erlbaum 1978.Suvarna Devi P. [se-mch] QUERY: Janani Suraksha Yojana (JSY) - Impact and Gaps in Implementation. Experiences; Examples. Reply by 14 August 2009.

Trivedi et al. Rapid urbanization-its impact on mental health: A south Asian perspective. Ind J Psychiatry 2008; 50 (3): 161-165.

CHAPTER 8

REPRODUCTIVE, MATERNAL, NEONATAL & CHILD HEALTH PLUS ADOLESCENT PROGRAM (RMNCH Plus A)

INTRODUCTION

The International Conference on Population and Development (ICPD) 1994, established an international consensus on a new approach to policies to achieve population stabilization. Fertility reduction should be addressed at the level of broad social policy, including reduction of gender discrimination in education, health care and income generation. It is realized that Reproductive Health Programs should focus on the needs of actual and potential clients, not only for limiting births but also for healthy sexuality and child bearing. In India, the implications of the reproductive health approach would be to shift the focus from the use of family planning as a tool intended essentially for population stabilization, to use of family planning as one among a constellation of interventions that would enable women and men to achieve their personal reproductive goals without being subjected to additional burdens of disease and death associated with their reproduction.

EVOLUTION OF FAMILY PLANNING

The need for control of rising population was realized just after independence. In 1951, India became the first country in the world to launch a family planning program. Since then approaches for reducing population growth have taken a variety of forms. It is interesting to learn about history and milestones of Family Welfare Program. The passive, clinic-based approach of the 1950s, gave way to a more proactive, extension approach in the early 1960s. In the late 1960s there was the emergence of a "time-bound", "target-oriented" approach with a massive effort to promote the use of IUDs and condoms. This was followed by an even more forceful "camp approach" to promote male sterilization in the 1970s. The excesses of these campaigns lead to a backlash from which it took years for the program to recover. The 1980s saw the rebuilding of the program with an emphasis on female sterilization and maternal and child health. In the 1990s the International Conference on Population and Development, Cairo, prompted a paradigm shift, with the advocacy of a client-centered, quality-oriented, reproductive health approach. Method-specific targets were removed, and the program focused on the unmet needs of clients, and RCH II continued with this approach. The National Population Policy of 2000 while legitimising the new approach also set 2010 as the target date to achieve replacement-level fertility. The chronology of events in family welfare movement is given below. In Jan 2013 RMNCH Plus A strategy was launched.

Milestones of Family Welfare Program

1951-56 • National Family Planning Program adopted by Government of India

1st Plan	first of its kind in the world
1961-66	• Extension education approach; expansion of services facilities along with spread of message small family norm
3rd Plan	• Department of Family Planning created in Ministry of Health • adopted Target Oriented Approach • Lippies loop introduced & Massive effort to promote IUCDs & Condom
1969-74	• Family planning services
4th Plan	• Primary Health Center • All India Hospital Post Partum Program • Medical Termination of Pregnancy (MTP) Act, 1971
1974-79	• Campaign for male sterilization
5th Plan	• Renaming Family Planning to Family Welfare • Community involvement • Child Marriage Restraint Act 1978
1983	• National Health Policy
1980-85	• Strengthening of Maternal and
6th Plan	Child Health • Strengthening Family Welfare
1985-90	• Further inclusion of various programs
7th Plan	under MCH
1992-97	• Child Survival and Safe Motherhood
8th Plan	Program (CSSM)
1993-94	• National Development Committee Report • International Conference on Population and Development (ICPD), Cairo, 1994
1996	• Target Free Approach • Review of Safe Motherhood Component of CSSM
1997-02	• Reproductive and Child Health, RCH
9thPlan	(CSSM plus STI & RTI components)
2000	• National Population Policy
2002	• National Health Policy
2002-07	• Planning for RCH-II
10th Plan	
2005	• RCH II and NRHM
2007-2012	• NRHM
11th Plan	
2013	• RMNCH Plus A strategy

International Conference on Population and Development (ICPD) was held in Cairo in 1994 and India was one of the signatories to the recommendations made there. They were:

1. Holistic reproductive health care should be made available through primary health care system;
2. Efforts should be made by all the states to reduce infant mortality by one-third and maternal mortality by 50% by 2000 AD; and
3. Need assessment and need fulfillment as key elements for improving reproductive health.

The government of India had reviewed the National Family Welfare Program on the basis of various surveys, reports and studies. Following facts were found:

- Targets / incentives distorted the program implementation. Achievement of targets had become ends in themselves. Disproportionate large portion of the targets (up to 40%) were being achieved in the last three months of the financial year instead of the services being provided evenly throughout the year. The targets were set at the state and central levels (Top down approach) that were never appreciated by the population and health workers at large;
- There were significant gaps existed in infrastructure and in outreach services;
- The choice of contraceptive was limited;
- Involvement of males was poor;
- Involvement of private sector was poor;
- Quality of service was poor that lead to more complication and generate distrust among users;
- Low budget allocation resulted in gaps in staffing, facilities, package of services;
- Training and reorientation program of staff was not uniform throughout country. There was hardly any skill development in training; and
- There was overlapping of family planning services;

The Department of Family Welfare after an in-depth sectoral review, undertook many pilot activities to prepare for a total shift in the implementation of the Family Welfare Program. Such a shift aimed at addressing the needs of women who were at risk of unwanted births, and assisted the country to accelerate fertility decline. India changed the strategy of National Family Welfare Program to Reproductive and Child Health in 1997 and in Ninth Five-year plan (1997-2002) a total change in implementation was recommended.

Emergence of Reproductive Rights

In order to achieve reproductive health women empowerment is must. It is also necessary that required changes be made in the social factors that hinder women's overall development and their rights. Reproductive rights means women's right to decide whether, when and how to have children – regardless of nationality, class, ethnicity, race, age, religion, disability, sexuality or marital status – in the social, economical and political conditions that make such decisions possible." The Women's Global Network for Reproductive Rights and international conventions elaborate reproductive rights that means:

- Right to have full information about sexuality and reproduction, about reproductive health and health problems, and about the benefits and risks of drugs, devices, medical treatments and interventions used for reproduction related problem.
- Right to have good quality, comprehensive reproductive health services that meet women's needs and are accessible to all women;
- Right to safe, effective women controlled contraception and sterilization without criminalization and its trivilization.
- Right to safe and legal abortion;
- Right to have safe pregnancy and childbirth;
- Right to have prevention and safe effective treatment for the causes of infertility; and
- Right to be respected as a partner and not used as a sex object.
- Right to marry at legally correct age (18 years upwards);
- Right to conceive at medically approved age (20 years upwards);
- Right to decide about time and number of conceptions;
- Right to space two births (3 years minimum);
- Right to obtain medical consultation during pregnancy (at least three checkups; tetanus injections);
- Right to protest against prenatal sex determination;
- Right to say "no" to female feticide;
- Right to refuse to get pregnant when medically advised against it;
- Right to obtain safe delivery services;
- Right to abortion when mental/physical health is threatened;
- Right to live with dignity in the family and society for being the mother of daughters only.

In addition to above, women have the right to refuse intercourse if physically/mentally she doesn't feel ready for it and right to safety from any inflicted sexual act or pregnancy against her wishes.

DEFINITION OF REPRODUCTIVE HEALTH

WHO defines reproductive health within the framework of definition of health as "a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity, the reproductive health addresses the reproductive processes, functions and systems at all stages of life. Reproductive health therefore implies that people are able to have a responsible, satisfying and safe sex life and that they have the capability to reproduce and the freedom to decide when, and how often to do so. This definition focuses on right of men and women to be informed of and to have access to safe, effective, affordable, and acceptable methods of fertility regulation of their choice, and the right of access to appropriate health care services that will enable women to go safely through pregnancy and childbirth and provide couples with the best chance of having a healthy infant" (WHO).

Keeping the obligation to international commitment and as a need Indian population, Government of India has brought a paradigm shift in the child health policy and accepted RCH program that has adopted life cycle approach. The Reproductive and Child Health program addresses women's health across their life cycle.

Women's health is important during all phases of their lives, from childhood to adulthood. Good health is cyclical in nature. In a women's lifetime, her health status during any phase of life impinges upon the next phase. When she gives birth, she passes on the gift of good health to the next generation. A healthy child grows up into a healthy adolescent, good health during adolescent years leads to health during reproductive years. The cycle continue into the next generation when a healthy pregnant ensures a healthy child. Beside new development internationally and within the country, India has learned many lessons from implementation of RCH-I, RCH-II and is looking forward to RMNCH A Plus. Paradigm is a set of concepts, methods, and assumptions shared by a community of scientists and guiding research in their discipline (Kishore 2013). This paradigm has been shifted towards quality, client

oriented, community responsive approach, and towards the overall development of woman and child securing their rights.

VISION FOR RCH-II

The vision is to bring about outcomes as envisioned in the Millennium Development Goals, the National Population Policy 2000 (NPP 2000), the Tenth Plan document, the National Health Policy 2002 and Vision 2020 India, minimizing the regional variations in the areas of Reproductive and Child Health and Population Stabilization through an integrated, focused, participatory program meeting the unmet demands of the target population, and provision of assured, equitable, and responsive quality services.

RCH II is viewed as a program and not as a project (a period of five years 2004-2009). The focus of the RCH was the reduction of Maternal Mortality Ratio, Infant Mortality Rate, Total Fertility Rate and increase of the Couple Protection Rate and the coverage of children through immunization. The strategies was needed to be developed to bring about assured, equitable, responsive and quality service and would be then, shifted to gear up on a mission mode. But variation in performance in different states has been observed that could be due to the deep-rooted sociocultural and geographic differences, which require a differential approach for a group of states.

Based on the above vision statement for RCH it was anticipated that the program would produce equitable maternal and child health outcomes including family planning and would contribute to raising the status of the girl child.

Goals of RCH-II

Goals of the RCH-II in comparison with other national and international commitment are given in Table 8.1.

The immediate Objective, as envisioned in the National Population Policy 2000 (NPP) is to address the unmet needs of contraception, health care infrastructure, health personnel and provide integrated service delivery for basic reproductive and child health care with special focus on Empowered Action Group (EAG) states/and states facing biggest socio-demographic challenges and the urban poor.

The medium term objective outlined in the NPP 2000 is to bring the Total Fertility Rate (TFR) to replacement level by 2010 through coordinated implementation of the inter-sectoral linkages.

The long-term objective is to achieve a stable population by 2045, at a level consistent with the requirements of sustainable economic growth, social development and environmental protection.

COMPONENTS OF RCH

RCH has following components:

1 Population Stabilization

2 Maternal Health (Essential Obstetric Care)

Table 8.1: Goals set for various national and International policies

Indicators	NRHM (2012) 11th Plan	RCH II Goals (2004-2009)	National Population Policy 2000 (By 2010)	Millennium Development Goals
Population growth	16.2% (2001-11)	16.2% (2001-11)	-	-
Infant Mortality Rate	30/1000	35/1000	30/1000	-
Under 5 Mortality Rate	-	-	-	Reduce by 2/3 from 1990 levels
Maternal Mortality Ratio	100/100000	150/100000	100/100000	Reduce by ¾ by 2015
Total Fertility Rate	2.1	2.2	2.1	-
Couple Protection Rate	63%	65%	Meet 100% needs	-

3 Reproductive Tract and Sexual Transmitted Infection control program
4 Newborn and child Health through Integrated Management of Neonatal and Child Health including diarrheal disease control program, respiratory infection control program, Breast feeding, Baby friendly hospital initiatives, Immunization, BCC, etc.
5 Prevention and control of Anemia
6 Prevention and Control of Vitamin A Deficiency
7 Universal Immunization Program
8 Cold Chain System
9 Polio Eradication: Pulse Polio Program
10 Adolescent Health
11 Urban Health
12 Tribal Health
13 Mainstreaming Gender and Equity in RCH II
14 Intersectoral and Donor convergence
15 Behavior Change Communication
16 Community Participation
17 Public Private Mix
18 Procurement and Logistics
19 Monitoring, Evaluation and Health Management Information System

RMNCH + A STRATEGY UNDER RCH

Different stages in the life cycle are interdependent so are the aspects of where and how healthcare is provided. There are two dimensions to healthcare: (1) stages of the life cycle and (2) places where the care is provided. These together constitute the 'Continuum of Care.' This Continuum of Care approach of defining and implementing evidence-based packages of services for different stages of the lifecycle, at various levels in the health system, has been adopted under the national health program (Figure 8.1). This strategic approach to Reproductive, Maternal, Newborn, Child Plus Adolescent Health (RMNCH+A) has been adopted under RCH (Govt of India 2013).

The 'Plus' in the strategic approach denotes the (1) inclusion of adolescence as a distinct 'life stage' in the overall strategy; (2) linking of maternal and child health to reproductive health and other components (like family planning, adolescent health, HIV, gender and Preconception and Prenatal Diagnostic Techniques (PC&PNDT); and (3) linking of community and facility-based care as well as referrals between various levels of health care system to create a continuous care pathway, and to bring an additive / synergistic effect in terms of overall outcomes and impact. This integrated strategy can potentially promote greater efficiencies while reducing duplication of resources and efforts in the ongoing program.

Problem Statement: Situation of Reproductive, Maternal and Child Health in India

Globally, an estimated 287,000 maternal deaths occurred in 2010, when the global maternal mortality ratio was 210 maternal deaths per 100,000 live births. Sub-Saharan Africa (56%) and Southern Asia (29%) accounted for 85% (or 245,000 in numbers) of the global burden of maternal deaths in 2010. At the country level, India accounted for 19% (56,000 in numbers) of all global maternal deaths. In terms of child mortality, globally 76 lakh children died in 2010 before reaching their fifth birthday. Presently accounts for nearly 20% of the world's child deaths. In 2010, India's child mortality rate (59 per 1,000 live births) almost equals the global average of 57. At the national level, maternal mortality ratio (MMR) declined from 254 (SRS 2005) to 212 (SRS 2007–09) – a decline of about 14 points per year on an 'All India' basis. The mortality rate in children below five years is 59 per 1,000 live births (SRS 2010), which translates into 15.8 lakhs deaths in the country per year. Currently India's TFR is 2.5 (SRS 2010). Currently, twenty-one states/union territories have already achieved the replacement level of fertility (i.e. 2.1) or less, while seven more states are on the verge of achieving replacement level fertility.

Goals & Targets

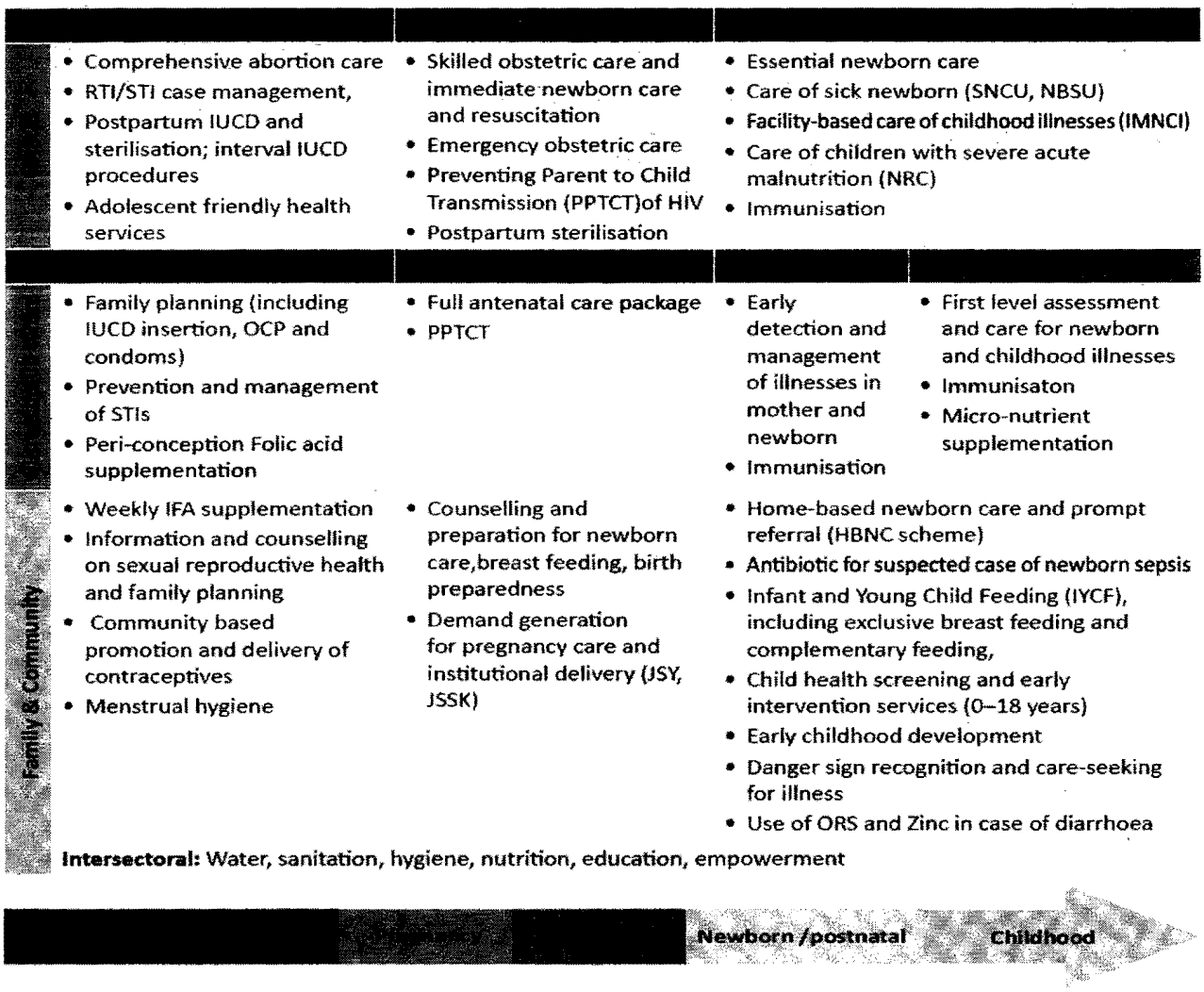
Health Outcome Goals established in the 12th Five Year Plan

- Reduction of Infant Mortality Rate (IMR) to 25 per 1,000 live births by 2017
- Reduction in Maternal Mortality Ratio (MMR) to 100 per 100,000 live births by 2017
- Reduction in Total Fertility Rate (TFR) to 2.1 by 2017

Coverage targets for key RMNCH+A interventions for 2017

- Increase facilities equipped for perinatal care (designated as 'delivery points') by 100%
- Increase proportion of all births in government and

Figure 8.1: Continunm of care across life cycle and different levels of health system


• Comprehensive abortion care
• RTI/STI case management,
• Postpartum IUCD and sterilisation; interval IUCD procedures
• Adolescent friendly health services
• Skilled obstetric care and immediate newborn care and resuscitation
• Emergency obstetric care
• Preventing Parent to Child Transmission (PPTCT)of HIV
• Postpartum sterilisation
• Essential newborn care
• Care of sick newborn (SNCU, NBSU)
• Facility-based care of childhood illnesses (IMNCI)
• Care of children with severe acute malnutrition (NRC)
• Immunisation
• Family planning (including IUCD insertion, OCP and condoms)
• Prevention and management of STIs
• Peri-conception Folic acid supplementation
• Full antenatal care package
• PPTCT
• Early detection and management of illnesses in mother and newborn
• Immunisation
• First level assessment and care for newborn and childhood illnesses
• Immunisaton
• Micro-nutrient supplementation
Family & Community
• Weekly IFA supplementation
• Information and counselling on sexual reproductive health and family planning
• Community based promotion and delivery of contraceptives
• Menstrual hygiene
• Counselling and preparation for newborn care,breast feeding, birth preparedness
• Demand generation for pregnancy care and institutional delivery (JSY, JSSK)
• Home-based newborn care and prompt referral (HBNC scheme)
• Antibiotic for suspected case of newborn sepsis
• Infant and Young Child Feeding (IYCF), including exclusive breast feeding and complementary feeding,
• Child health screening and early intervention services (0–18 years)
• Early childhood development
• Danger sign recognition and care-seeking for illness
• Use of ORS and Zinc in case of diarrhoea
Intersectoral: Water, sanitation, hygiene, nutrition, education, empowerment
Newborn /postnatal
Childhood

accredited private institutions at annual rate of 5.6 % from the baseline of 61% (SRS 2010)

- Increase proportion of pregnant women receiving antenatal care at annual rate of 6% from the baseline of 53% (CES 2009)
- Increase proportion of mothers and newborns receiving postnatal care at annual rate of 7.5% from the baseline of 45% (CES 2009)
- Increase proportion of deliveries conducted by skilled birth attendants at annual rate of 2% from the baseline of 76% (CES 2009). Increase exclusive breast feeding rates at annual rate of 9.6% from the baseline of 36% (CES 2009)
- Reduce prevalence of under-five children who are underweight at annual rate of 5.5% from the baseline of 45% (NFHS 3)
- Increase coverage of three doses of combined diphtheria-tetanus-pertussis (DTP3) (12–23 months) at annual rate of 3.5% from the baseline of 7% (CES 2009)
- Increase ORS use in under-five children with diarrhoea at annual rate of 7.2% from the baseline of 43% (CES 2009)
- Reduce unmet need for family planning methods among eligible couples, married and unmarried, at annual rate of 8.8% from the baseline of 21% (DLHS 3)
- Increase met need for modern family planning methods among eligible couples at annual rate of 4.5% from the baseline of 47% (DLHS 3)
- Reduce anaemia in adolescent girls and boys (15–19 years) at annual rate of 6% from the baseline of 56% and 30%, respectively (NFHS 3)
- Decrease the proportion of total fertility contributed by adolescents (15–19 years) at annual rate of 3.8% per year from the baseline of 16% (NFHS 3)

- Raise child sex ratio in the 0–6 years age group at annual rate of 0.6% per year from the baseline of 914 (Census 2011)

RMNCH A Plus Strategies includes

A. Adolescent Health

Priority interventions

1. Adolescent nutrition; iron and folic acid supplementation
2. Facility-based adolescent reproductive and sexual health services (Adolescent health clinics)
3. Information and counselling on adolescent sexual reproductive health and other health issues
4. Menstrual hygiene
5. Preventive health checkups

B. Pregnancy and Childbirth

Priority interventions

1. Delivery of antenatal care package and tracking of high-risk pregnancies
2. Skilled obstetric care
3. Immediate essential newborn care and resuscitation
4. Emergency obstetric and new born care
5. Postpartum care for mother and newborn
6. Postpartum IUCD and sterilisation
7. Implementation of PC&PNDT Act

C. Newborn and Childcare

Priority interventions

1. Home-based newborn care and prompt referral
2. Facility-based care of the sick newborn
3. Integrated management of common childhood illnesses (diarrhoea, pneumonia and malaria)
4. Child nutrition and essential micronutrients supplementation
5. Immunisation
6. Early detection and management of defects at birth, deficiencies, diseases and disability in children (0–18 years).

D. Reproductive health

Priority interventions

1. Community-based promotion and delivery of contraceptives
2. Promotion of spacing methods (interval IUCD)
3. Sterilisation services (vasectomies and tubectomies)
4. Comprehensive abortion care (includes MTP Act)
5. Prevention and management of sexually transmitted and reproductive infections (STI/RTI).

Program Management

At each district, a dedicated directorate official (possibly Additional Chief Medical and Health Officer (CMHO) /RCH Officer) for RMCNH+A (including maternal health, child health, family planning and adolescent health). Additional CMHO, RCH Officer to be supported by separate dedicated full-time staff for maternal health, child health, family planning and adolescent health components.

ADOLESCENT HEALTH

INTRODUCTION

Adolescence refers more broadly to the phase of human development encompassing the transition from childhood to adulthood. In terms of age, it is a period of life that is extended from 10-19 years which includes pubertal development also. This period is very crucial since these are the formative years in the life of an individual when major physical, psychological and behavioral changes take place. This is also an impressionable period of life. This is also the period of preparation for undertaking greater responsibilities including healthy responsible parenthood. Future of a society depends on adolescents and they form a great human resource for the society. Nutritional and health needs of the adolescent are also more because of more requirement for growth spurt and increase in physical activity. Adolescent need more of all nutrients particularly calcium, iodine and iron. The need for more iron in adolescents is due to growth spurt and the onset of menstruation. Inadequate iron storage during adolescence and before conception is a major cause of iron deficiency anemia during pregnancy, which aggravates the risk of death due to anemia during pregnancy. Far too many of the estimated 16 million teenage girls (across the world) who give birth every year never had the opportunity to plan their pregnancy. It is rooted in poverty, gender inequality, child marriage and lack of education. It often means an abrupt end to childhood, curtailed education and lost opportunities.

Facts about Adolescents in India

- Adolescents constitute over 23% of the population in India. High birth rate will continue to increase this number.
- Half of the group is sexually active before marriage. Fertility Rate is high in adolescent group as a result, this population faces all problems of early motherhood specifically risk of death and

disability for both the mother and her newborn child. There is low level of knowledge and use of family planning methods and healthy sexuality. According to NFHS 3, 19.8% of women in age group of 15-19 years are already pregnant means 4.5 million The age specific fertility rate for 15 -19 age group is 107 per 1000. Only 59% of adolescents know about condoms and 49% know about oral contraception. Contraception use amongst married adolescents of age 15-19 years is only 7%.

- It is also estimated that half of them suffer from nutritional anemia and about 59% boys and 37% girls are stunted (NNB 2000). In another study of urban area it was found that 35.1% of the adolescents were anemic. There was significant association of anemia with parental educational status (Chaudhary et al 2008). Similar findings were made by Rawat in Meerut UP and Rajaratnam in Tamil Nadu. Bulliyy et al (2007) found in non-school going girls, the anemia was as high as 46.9%. However, Toteja et al (2006) stated that anemia prevalence in adolescent girls is as high as 90%.
- They are more prone to acquiring sexually transmitted infections. Young people between the ages of 10-25 years make up 50% of all new HIV infections.
- Many are not immunized against tetanus.
- Adolescence is the last opportunity to correct growth lag.

Table 8.2: Top killers of young and adolescents in Rural India

Specific cause	*Age groups*	
	15-19 yr	20-24 yrs
Suicides	23.5	27.7
Drowning	28.6	19.5
Vehicular accidents	22.5	18.3
Anemia	13.9	19.4
TB lungs	7.0	12.1
Burns	13.2	27.8
Cancer	6.1	8.6
Heart Attack	3.8	17.8
Bronchitis & Asthma	4.8	13.5

** Source: RGI 2002, All figures are in percent*

- Health workers attitudes toward adolescents, and the lack of privacy and confidentially when seeking reproductive health services are known to be significant barriers to demand and as a result adolescents avoid visiting public health facilities. Therefore, on one hand, we need to reach out to them in communities, and on the other hand, orient the health system to the felt and unmet needs of the adolescents.
- In rural areas the top killers of adolescents and youth are suicides, drowning, vehicular accidents, burns, etc (Table 8.2).

HEALTH PROBLEM

Physiological Problems

Irregular Menstrual cycles: Irregular bleeding is sometimes seen after menarche. Health worker should reassure the girl and her parents and advise her to take nutritious diet. In most of the cases the periods get regular within about 2 years of menarche. If they do not get regular by 2 years, then refer the girl to a doctor (PHC/CHC).

Acne: is a common skin problems in adolescents and youth and causes lot of stress among them.

Reproductive Health problems

Bigger and most populated states of the country has shown the higher percentage of adolescent girls married by the age of 18 years.

Behavioral Problems

Risk behavior: A significant number of adolescents are engaged in high risk behavior that results in appreciable morbidity or mortality. A large number of school adolescents in urban areas get exposed to sexual intercourse and many a time they do not use safety measures. Similarly, many adolescents keep experimenting with drugs. Risk taking behavior of adolescents in India is also high and some keeps knife, rods, and chain (Kishore 1999). Between 2003 and 2011, in adolescents aged 12–15 years, roughly 12–16% reported tobacco or alcohol use, 75% reported low fruit and vegetable intake or low physical activity, and 7% were obese. Furthermore, just over 40% had two cardiovascular risk factors and one adolescent in ten had three or more of these risk factors. The main preventive strategies in adolescents are to promote an active lifestyle; restrict television viewing; promote the intake of fruits and vegetables; and restrict the intake of energy-dense, micronutrient-poor foods, and sugar-sweetened beverages (Uauy R 2010). The creation of an environment that is conducive for these behaviours is fundamental.

Teenage Pregnancy: Adolescent pregnancies are high in number and associated with illegal abortion and infection leading to death.
Sexually transmitted Diseases: High prevalence of sexual intercourse in adolescents is associated with high risk of sexually transmitted diseases and HIV/ AIDS because many do not use condom. Majority of adolescents (70% of male and 80% of female) had not even heard of STDs (Kishore 2006).

A Report released on World Contraception Day 2011 showed that 28% of the young people had sex and 32% had sex with new partner without using contraceptive. It is also stated that school do not provide comfortable environment for question is a barrier to them to obtain accurate information (26%).

Nutritional Problems
Undernutrition: Undernourished adolescents may suffer from impaired growth, anemia, iodine deficiency, etc. Adolescent should be advised to take nutritious diet and whenever they have manifestations of any disease they must consult doctor.
Anemia in Adolescents: Anemia is a major nutritional deficiency disorder in India and other developing countries. Large population surveys in rural India indicate that the prevalence of anemia ranges from 38-72% depending upon age and sex (Choudhury et al 1994). Hookworm, malaria and other infections if present further aggravate iron deficiency and increase its prevalence. The iron deficiency prevalence in adolescent girls has been reported to be high (22-92%) in various studies (Vasanthi et al 1994, SWACH 1997, Rajaratnam et al 2000). The reasons for high incidence of anemia in adolescents girls are:

- Increased iron requirements because of growth.
- Menstrual loss.
- Discrepancy between high iron need for hemoglobin formation and low iron content of foods that are commonly eaten.
- Dislike for foods rich in iron: green leafy vegetables.
- Iron absorption inhibitors in food: phytates/tannins
- Frequent dieting/erratic eating habits.

The following cut off points suggested by WHO are used to determine if iron deficiency anemia is a major problem:

Prevalence	*Public Health Problem*
Prevalence < 5%	Not a problem
Prevalence 5-14.9%	Low magnitude
Prevalence 15-33.9%	Moderate magnitude
Prevalence 40 and above	High magnitude

The National Family Health Survey (NFHS-3) has already reported that anemia in India is a major health problem, the level being 56% in 15-49 years of age group women which was 53% in NFHS -2. Among men it is 24% in age group of 15-49 years.

Prevalence of obesity:- Pediatric obesity is an emerging problem in developing countries, especially among higher socioeconomic status groups. Significant gender disparity is seen, with boys of affluent background having a higher prevalence. In a study conducted in 2004 on school aged children 9-15 years showed that the overall prevalence of obesity and overweight was 11.1% and 14.2% respectively. The prevalence of obesity as well as overweight was higher in boys as compared to girls (12.4% vs 9.9%, 15.7% vs 12.9%). Prevalence of obesity decreased significantly with age, from 18.5% at 9 years to 7.6% at 14 years, rising at 15 years to 12.1%. Significantly more children from higher socioeconomic status were obese and overweight than those from lower socioeconomic status groups.

In 2001, lifestyle diseases accounted for 46% of morbidity and 60% of mortality.

Legislation
The Child Marriage Restraint Act, 1978: The act prescribes the minimum age at marriage for girls as 18 years and for boys at 21 years.
The Juvenile Justice (Care and Protection) Act, 2000: For special treatment, care, protection and rehabilitation of juvenile delinquents and neglected children (Male below 16 years and females below 18 years).
The Child Labour (prohibition and regulation) Act, 1986: Regulates minimum legal age limit (14 years) for employment of children and prohibits engagement of children in certain employments.
Immoral Traffic (Prevention) Act (ITPA) , 1986: Prohibits trafficking in human beings , including children.
The Narcotic Drug and Psychotropic Substances

(NDPS) Act, 1985: Mainly deals with supply reduction activities.

There is special Charter for children and youth policy. Details about the law and policy can be obtained from the respective chapters of the book.

Government initiatives

Ministry of Health & Family Welfare

- NRHM / RCH - II: RMNCH A Plus Strategy
- NACP: Focus on young people

Other Govt. Departments:

- Youth and Sports: Youth clubs
- Education: Adolescent Education Program
- Others Scheme
- Women Child Development: Kishori Shakti Yojana

Under NRHM and RCH for Adolescent Health

Priority interventions

1. Adolescent nutrition; iron and folic acid supplementation
2. Facility-based adolescent reproductive and sexual health services (Adolescent health clinics)
3. Information and counselling on adolescent sexual reproductive health and other health issues
4. Menstrual hygiene
5. Preventive health checkups

1. Adolescent Nutrition and Folic Acid Supplementation

As part of the new adolescent health strategy, in order to generate awareness, communication on consumption of balanced diet, nutritious food and inter-generational effects of malnutrition is deemed essential. Nutrition education sessions to be held at the community level using existing platforms like VHND, Kishori Diwas, school setting, Anaganwadi Centres (AWC) and Nehru Yuva Kendra Sangathan (NYKS). Nutritional counselling on a dedicated quarterly Adolescent Health Day (to coincide with Kishori Diwas in SABLA districts) is also proposed. To make deeper inroads, nutrition education is to be included in school curriculum, establishing working linkages with 'Sakshar Bharat' Abhiyan.

Since the National Health Program does not include the component of direct nutrition supplementation, linkages with MWCD (SABLA scheme) and MoHRD (Mid-Day Meal Programme) for supplementary nutrition, fortification and nutritional assessment is to be prioritised.

Child health screening and early intervention services(RBSK): Under the child health screening and early intervention services, screening of adolescents for low Body Mass Index proposed and this will be followed by counselling at adolescent health clinics.

National Iron + Initiative

National Iron + Initiative provides a minimum service package for the management of anaemia across life stages and at different levels of care. This initiative brings together existing programmes for iron and folic acid (IFA) supplementation among pregnant and lactating women and children in the age group of 6–60 months, and proposes to include new age groups (adolescents ; women in reproductive age group). National Iron + Initiative will include, adolescents (10–19 years), both in and out of school. Those in school will be reached through ***Weekly Iron and Folic Acid Supplementation (WIFS)*** described while 'out of school' adolescents will be reached through AWCs. The iron and folic acid (IFA) tablet for adolescents is coloured blue (*'Iron ki nili goli'*) to distinguish it from the red IFA tablet for pregnant and lactating women

Weekly iron and folic acid supplementation scheme

The Weekly Iron and Folic Acid Supplementation (WIFS) scheme is a community-based intervention that addresses nutritional (iron deficiency) anaemia amongst adolescents (boys and girls) in both rural and urban areas. It aims to cover adolescents enrolled in class VI–XII of government, government aided and municipal schools as well as 'out of school' girls. The key features of the scheme are (1) Supervised administration of weekly iron and folic acid supplements of 100 mg elemental iron and 500 mcg folic acid; (2) Screening of target groups for moderate and severe anaemia and referral to an appropriate health facility; (3) Bi-annual de-worming (Albendazole 400 mg) and (4) Information and counselling for improving dietary intake and preventive actions for intestinal worm infestation.

2. Adolescent Friendly Health Services (Adolescent Health Clinics)

Community-based intervention and demand generation initiatives will be linked to facility-based services across all levels of health system. Services at sub centre level will be provided by the ANM while an Adolescent Information and Counseling Centre will be made functional by the Medical Officer and ANM at the Primary Health Centre on a weekly basis. At the Community Health Centre, District Hospital/Sub District Hospital/Taluk/Area Hospital and Medical College, Adolescent Health Clinics will provide services on a daily basis. A dedicated counsellor will be available on all days at higher-level facilities (Community Health Centre onwards). Services in adolescent health clinics will be available to all adolescents: married and unmarried, girls and boys, and will be further expanded and strengthened. Special focus will be given to establishing linkages with Integrated Counseling and Testing Centres (ICTCs) and making appropriate referrals for HIV testing and RTI/STI management; providing comprehensive abortion care; and provision of information, counseling and services for contraception to both married and unmarried adolescents. The provision of contraceptives is to be made through this clinic, while ensuring continuous contraceptive supplies and services.

Adolescent Health Clinics provide following services:

Clinical services

- General examination
- Nutrition advice
- Detection and treatment of anemia
- Easy and confidential access to medical termination of pregnancy
- Antenatal care and advice regarding child birth
- RTIs/STIs detection and treatment
- HIV detection and counseling
- Treatment of psychosomatic problems
- De-addiction
- Other health concerns

Counselling services

Counseling services will be provided as per the behavior change domains referred to above problems and issues. According to target group such as rural or urban adolescent group counseling or individual counseling sessions need to be carried out by health providers and partners.

3. Information and counseling on adolescent sexual reproductive health and other health issues

Definition of life skills: The World Health Organization has defined life skills as, "the abilities for adaptive and positive behavior that enable individuals to deal effectively with the demands and challenges of everyday life". UNICEF defines life skills as "a behavior change or behavior development approach designed to address a balance of three areas: knowledge, attitude and skills".

Life Skills Education is a novel promotional program that teaches generic Life Skills through Participatory Learning Methods of games, debates, role-plays, and group discussion. Conceptual understanding and practicing of the skills occurs through experimental learning in a nonthreatening setting. Such initiatives provide the individual with a wide range of alternative and creative ways of solving problems pertaining to various health and psychosocial issues like Drug Use, Sexual Abuse, Teenage Pregnancy, Early Sexual Experimentation, Bullying. Repeated practicing of these skills leads to a certain mastery and application of such skills to real life situation and gain control over the situation. It is a promotional program, which improves the positive health and self-esteem.

Ten **Life Skills**, which need to be taught at the schools level especially to adolescents are:

* Critical Thinking & Creative Thinking
* Decision Making & Problem Solving
* Communication Skills & Interpersonal Relations
* Coping with Emotions & Stress
* Self Awareness & Empathy

The life-skills-based adolescence education program implemented through schools provides an important opportunity to inform and educate adolescents on relevant health issues. While awareness and skill building through Life Skills Education will be the mechanism to counter pressure to experiment with addictions such as tobacco, alcohol or drugs, the health service providers will be trained to screen and make appropriate referrals and linkages with de-addiction centres. To promote favourable attitudes against gender-based violence, awareness and skills to challenge gender stereotypes, discrimination and

violence shall be incorporated in adolescence education program. To promote healthy lifestyle (physical activity, healthy diet) and generate awareness on risk factors for NCDs (for example, tobacco and alcohol use, junk food), school setting will serve as the platform to educate and counsel adolescents on behaviour risk modification (avoidance of junk foods with high carbohydrates, sedentary life style, tobacco and alcohol). It is recommended that schools should incorporate at least 60 minutes of physical activity per day for every working day. Under the Child Health Screening and Early Intervention Services, screening for diabetes and other non-communicable diseases is proposed, following which, if required, children will be referred for treatment and management to an appropriate health facility. The community settings for informing adolescents are the Adolescent Health Day, 'Kishori Samooh' under SABLA scheme (Ministry of Women and Child Development) and Teen Clubs (Nehru Yuva Kendra Sangathan, under the Ministry of Sports & Youth Affairs).

In order to address mental health issues, the adolescent health strategy envisages promotion of protective factors such as self-esteem, healthy relationships, and the ability to deal with stress and conflicts positively. The peer educators will be trained to counsel adolescents on these issues and service providers (teachers, AWW ANMs and Preraks etc.) will be trained to screen for anxiety, stress, depression, suicidal tendencies and refer them to appropriate facility. In order to reduce adolescent pregnancy, focused messaging to individuals, families and communities (including men) will be reinforced through the Life Skills Education sessions that are delivered from various adolescent centric platforms including community outreach sessions and Anganwadi centres.

4. Scheme for promotion of menstrual hygiene among adolescent girls in rural India:

The scheme promotes better health and hygiene among adolescent girls (aged 10 to 19 years) in rural areas by ensuring that they have adequate knowledge and information about the use of sanitary napkins. Through the scheme, high quality and safe products are made available to the girls and environmentally safe disposal mechanisms are made accessible. The sanitary napkins are provided under NRHM's brand 'Free days'. These napkins are being sold to adolescent girls by ASHAs.

5. Preventive health checkups and screening for diseases, deficiency and Disability

The new approach in the implementation of the School Health Programme is to establish dedicated mobile health teams at block level. These teams will include two Medical Officers (MBBS/Dental/AYUSH qualified) and two paramedics (one ANM and any one of the following: Pharmacist/Ophthalmic Assistant/ Dental assistant). These teams will be provided mobility support (dedicated hired vehicle) as per the approved norm of the state, equipment and medicines.

Evaluation and Operational Research

There are many types of evaluation, however, it would be useful if process and outcome evaluation is carried out of this program. "***Process evaluation***" documents what has been done and with whom. Documenting such activities helps you know what services have been delivered, to whom and when, with what level of quality. "***Outcome evaluation***" documents whether what has been done has made a difference. It is conducted to determine any changes that have occurred and to demonstrate that the changes identified are the result of the intervention itself, not some other factors.

Both process indicators and outcome indicators are necessary for a thorough evaluation, and should be considered at different levels (i.e. for participants, for the facilitators or teachers, and for the overall program).

For the program success it is important to carefully monitor and evaluate its implementation. It is also important that operational research studies are built into the program to develop new strategies, as adolescent health emerges as an increasingly important priority for India in coming years.

For the adolescent development the Ministry of Youth Affairs and Sports has been chosen as nodal ministry and Ministry of Family Welfare as supportive ministry. The population education program is being implemented by NCERT through inclusion of adolescent

reproductive sexual health in curriculum and teachers training. The department of Family Welfare has also supported setting up adolescent friendly health clinics in some selected hospitals/medical colleges of States on pilot basis. The Family Welfare department has developed a module on adolescent health for out of school and rural youth. This module enables to help primary health functionaries to impart sensitization and orientation programs to adolescents so as to improve their existing level of knowledge through life skill education. In addition, Departments of Education, Women and Child Development, Rural Development and the state governments also have important roles to play in this endeavour.

Progress

- Supportive Policies:
  - Adolescent Health & Development Strategy under RCH
  - National Standards and Guidelines: 'Implementation Guide'
  - Support States in Planning for Implementation
- Strategic Information:
  - Using existing mechanisms and available data
  - Monitoring: HMIS, Quality, Coverage and Cost assessment
  - QA Process: under development
- Adolescent Friendly Services:
  - Capacity Building of providers
  - IEC Materials
  - Implementation models in districts
- Strengthening other Sectors:
  - HIV/AIDS and Young People initiative
  - Deptt. of Women and Child Development, Youth, Education
  - School Health: Strengthening ARSH component
- 28 out of 35 states / UTs have started implementation of adolescent health services through public health system
- Investment of 300 Million Rupees (6 million USD) from the domestic budget during the current year
- States are at various stages of implementation of AFHS

Comments

The National Adolescent Health program is underpinned by evidence that it is during adolescence that minds can be influenced positively and attitudes and behaviour modified for better, making it the most important stage of the life cycle for health interventions. The strategy is more holistic in approach addressing all the health concerns and needs affecting this age group. Further, the strategy has gone beyond the clinical perspective and is based on sound public health principles. The in-built monitoring and evaluation system adds to strength of the strategy. The strategy talks of convergence with other departments that indirectly or directly impact the health status of adolescents. What is more heartening is the fact that the strategy includes adolescent health services into the existent three tier health care delivery system. This avoids duplication work and wastage of resources that may be required in constructing a new adolescent health service facility or infrastructure.

Initially the focus of adolescent health in many places was on sex education which has resulted in resistance from school teachers, religious clergy and parents. Many states such as Maharashtra, Gujarat, and Madhya Pradesh have banned sex education materials in schools. This action go against the moral of experts and public at large who favor that their children at the national level should get sex education and prevent themselves from sexually transmitted diseases and pregnancies. From time to time in politics and high officials in the ministry's comments are detrimental to sex education in schools and colleges.

From the health status of adolescents in India it is clear that they have significant morbidity inspite of various preventive health programs. Either these programs are not focused to adolescents or beneficiaries are not coming forward to get the health services. As adolescence phase is crucial to future growth and development of the person, special attention is required. Adolescent health first time has mainstreamed into the general health system where appointment of counselor has been envisaged beside capacity building of all health personnel.

Integration of adolescent health issues into medical and nursing education remains a challenge. Paucity of trained human resources in adolescent health also needs to be addressed. Further, how the adolescents' views/perspectives will be included in the monitoring and evaluation of the programme still remains to be seen.

The fact is that the dynamics of adolescent behavior is very complex, but we need to try better their living standards, nevertheless. To say the least, there is an urgent need for us to follow a holistic approach towards adolescent needs and concerns which this programme envisages. We as a society need to address this issue on priority basis in a non-judgmental manner. Only then would we able to equip our children with all the required essentials of happy and healthy living.

SANITARY NAPKIN PROGRAM

Bad menustrual hygiene may give rise to infection. In one of the survey conducte by NGO, it was found that 72% of respondents did not know about sanitary napkins and others came to know about sanitary napkins through Aganwadi workers and TV. 94% of them used cloth. 79% of them washed the cloth for reuse though 32% told they used only once. 85% respondents are not aware about first menstrual period. 45% respondents are aware about the use of sanitary napkin, in which 73% has received information about sanitary napkin from families and friends and 26% has received information from communication and 1% has received information from other source. 55% respondents are not aware about sanitary napkin. 95% respondents are using cloth during their menstrual period, where as only 5% respondents are using sanitary napkin. 96% respondents dispose their cloth in open place, 2% respondents are disposing in pit, where as 2% reuse the cloth after washing and drying either in open sun or in the house. 99% respondents uses the cloth for one time only. 56% respondents reveals that they are not using sanitary napkin due to lack of awareness, 38% has sighted cost as the reason, 5 % has reflected reason of non-availability and 1% has reflected reason of not comfortable in use. 10% respondents are using toilet during their menstrual period in which 89% are feeling safe, hygiene and comfortable in using toilet.

Due to un-availability of toilet 89% respondents are managing their menstrual related activities in their house only and 7% are managing their menstrual related activities in agriculture field.13% are not attending class in which 92% have reflected health problems as a reason for not attending class during menstrual period. 78% respondents work as usual during their menstrual period, where as 9% take rest during menstrual period and 13% work and take rest during their menstrual period. 90% respondents not practicing hand wash behaviour. 56% respondents are facing urinal problems in which 94% have reflected un-hygiene practices as reason for their urinal problems and 6% respondents have not given answer.

Thus promotion of sanitary napkins is to be encouraged. Recent announcement on promotion of sanitary napkins by Ministry of Health is a step in the right direction. Disposal is a problem though at institutional level (schools, community toilets) incinerators can be promoted but at Household level disposal is still a problem. Similar survey was carried out by Sharma G funded by ICMR from Kalawati Saran hospital, New Delhi. According to this study majority of adolescent girls (84%) and mothers of adolescent girls (92.9%) were using cloth during menstruation, which they were reusing, after washing it. Though the washing of the cloth was being done at a clean place by majority of the respondents, but only 61.6% adolescent girls and 45.6% mothers of adolescent girls were drying the cloth under the sun. Only 40 percent adolescent girls had access to toilet facilities. About 37.8 percent unmarried adolescent girls reported about vaginal discharge accompanied with itching (21.6 %) and foul smell (27.5%).

According to people, ***Rural Haats*** are very much popular where people trade their product and services. It is a place where they spend a considerable time, share their thought and emotion. In some places, Haats are day long event and attract people from far flung places. People from all age groups come there including the adolescents. ***Cotton stripes*** were woven and sold by traditional weavers much before the popularization of sanitary napkins in these. These haats can be used for sanitary napkins to promote. Another option for providing napkins is in ASHA kit. But quality of product should be ensured as the cotton or material used for manufecturing napkins may give rise to allergy.

Beside providing good quality sanitary napkins adolescent girls need to be educated about menstrual hygiene.

PREGNANCY AND CHILD BIRTH

BURDEN OF MATERNAL MORTALITY

WHO estimates show that out of the 529,000 maternal deaths globally each year 136,000 (25.7%) are contributed by India, which is highest burden for any single country in the world. Maternal Mortality Ratio (MMR) was 407 in 1998 (SRS -1998) which reduced to 254 (SRS-2006) but according to NFHS-II (1999) it was 540 (rural 619 and urban 267). The highest rates are in UP (707), Bihar (452), Assam (409), Rajasthan (670), Madhya Pradesh (498) whereas it is lowest in Gujarat (28), Tamil Nadu (79) and Kerala (198). The causes of maternal deaths estimated by the Registrar General of India in 1998 are shown in Table 8.3.

Causes

Direct obstetric causes are abortion, ectopic pregnancy, preeclampsia, eclampsia, antenatal and post natal hemorrhage, puerperal sepsis; indirect causes are anemia, malnutrition, cardiac diseases, diabetes, TB, thyroid; and non-obstetric causes are accidents, TB, Malaria, typhoid, infection and HIV/AIDS.

National Population Policy

- Reduce maternal mortality ratio to less than 100 per 100000 live births by the year 2010.
- Increase proportion of institutional deliveries to 80% by 2010.

Table 8.3: Causes of maternal deaths

Causes	% Maternal deaths (SRS 1998)	SRS 2004
Hemorrhage	30	38
Anaemia	19	11
Sepsis	16	5
Obstructed labor	10	5
Abortion	9	8
Toxaemia	8	-
Other	8	34

RNMCH A Plus strategy

Priority interventions

1. Preventive use of folic acid in peri-conception period
2. Delivery of antenatal care package and tracking of high-risk pregnancies
3. Skilled obstetric care
4. Immediate essential newborn care and resuscitation
5. Emergency obstetric and new born care
6. Postpartum care for mother and newborn
7. Postpartum IUCD and sterilization
8. Implementation of PC&PNDT Act

1. Preventive use of folic acid in peri-conception period

Promoting use of folic acid in planned pregnancies during the peri-conception phase (three months before and three months after conception) for the prevention of neural tube defects and other congenital anomalies is a community-based intervention that can be undertaken by frontline workers and facility-based service providers. Pre-pregnancy check-ups can be offered as a component of maternity care, with one pre-pregnancy visit for couples planning pregnancy. In states where a larger number of pregnancies are 'planned', this intervention should be included in the package of RMNCH+A services.

2. Antenatal care package and tracking of high risk pregnancies

Antenatal care package is delivered both at community outreach and health facility level. Timely identification of complications enables service providers to make timely referrals to health facilities equipped to provide emergency obstetric and newborn care. ***Mother and Child Tracking system (MCTS)*** is one mechanism that enables service providers to follow up women and programme managers to monitor service delivery. To ensure prevention of HIV transmission to newborn babies under the PPTCT programme, currently single dose Nevirapine (Sd NVP) is being given as prophylaxis at the onset of labour pains or during delivery followed by Syrup Nevirapine to the baby soon after birth. The new PPTCT Guidelines 2012 recommend moving from the single-drug prophylaxis to multi-drug prophylaxis in a phased manner (Refer to chapter on NACP).

3. Skilled obstetric care and essential newborn care and resuscitation

Operationalizing delivery points: Delivery points are to be prioritised for the allocation of resources (infrastructure and human resources, drugs and

supplies, referral transport etc.) in order to ensure quality of services and provision of comprehensive RMNCH services at these health facilities. This approach has helped to direct resources and focus attention on those facilities that already have higher footfalls. These facilities will be branded and positioned as quality RMNCH+A 24 X 7 service centres within the public health system. A new development under JSY is the decision to make direct cash payments through AADHAR enabled payment system and this has been introduced in forty-three districts to begin with. This requires enrolment of all potential JSY beneficiaries on the MCTS portal, facilitating registration for AADHAR and opening/linking bank accounts to AADHAR for all potential JSY beneficiaries that do not have AADHAR number, entering AADHAR details and bank account numbers on the portal for regular reviewing and monitoring.

JANANI SHISHU SURAKSHA KARYAKRAM (JSSK)

Service guarantees and elimination of out-of-pocket expenses: ***Janani Shishu Suraksha Karyakram (JSSK)*** is an initiative under the overall umbrella of NRHM that aims to reduce out-of-pocket expenses related to maternal and newborn care. The scheme implemented across the country entitles all pregnant women delivering in public health institutions to absolutely free and no expense delivery, including caesarean section. Similar entitlements are in place for all sick newborn (first 30 day of life) accessing public health institutions for treatment. Free assured transport (ambulance service) from home to health facility, inter-facility transfer in case of referral and drop back is an entitlement under JSSK. This provision of the scheme addresses level II delays on account of transport availability. Vehicles with provision for advanced life support, trained staff and equipment are made available with the ambulance to manage emergencies during transit. In 'hard-to-reach areas' the 'last mile' connectivity requires innovations and use of informal transport methods to reach the health facility or to an access point from where ambulances can transport pregnant women to the health facility. For routine drop back facilities, a low-cost transport network is being established working either through the government mechanism or through outsourcing.

JSSK initiative is estimated to benefit more than one crore pregnant women & newborns who access public health institutions every year in both urban & rural areas.

It has been described that the number of institutional deliveries, a key determinant of maternal mortality, has increased from seven lakhs (2005-06) to more than a crore (2010-11). One of the significant activities for saving the lives of the mother and also the infant is provision of quality ante-natal and post-natal services. Presently it is noted that, out of pocket expenses and user charges for transport, admission, diagnostic tests, medicines and consumables, caesarean operation are being incurred by pregnant women and their families even in the case of institutional deliveries (http://pib.nic.in/newsite/PrintRelease.aspx 15-08-2011).

NAVJAAT SHISHU SURAKSHA KARYAKRAM

Every year, nearly 12 lakh newborn babies die in India. Most of these deaths occur within the first few days of birth. To address this serious issue, the Government of India launched a program on 15th September 2009 to train the healthcare providers at District Hospitals, Community Health Centers and Primary Health Centers across the country in management of resuscitation, prevention of infection, Hypothermia (temperature management) and early initiation of breast-feeding of the newborns.

Essential newborn care and resuscitation: Recognizing that events at the time of birth are critical to newborn survival, Newborn Care Corners are established at delivery points and providers are trained in basic newborn care and resuscitation through ***Navjaat Shishu Suraksha Karyakram (NSSK)***. The saturation of all delivery points with Skilled Birth Attendance and NSSK trained personnel and functional Newborn Care Corners are the topmost priority under the national program. Linkages with ***sick Newborn Care Units*** at health facilities (FRU and District Hospital) must be in place to refer newborns requiring special or advanced newborn care (Figure 8.2).

Govt. of India is also releasing the module on Facility Based Integrated Management of Neonatal and Childhood Illnesses (F-IMNCI) which seeks to multi-skill the general doctors to meet the shortage of pediatricians in the country. Module can be used for health workers for their skill development.

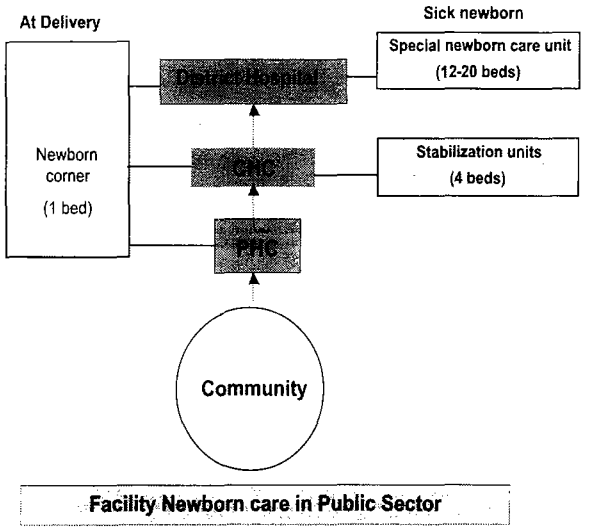


Figure 8.2: New Born Care

Sick Newborn Care Units (SNCUs) at District Hospitals, Newborn Stabilization Units at Community Health Centres and Newborn Corners at every facility, where deliveries are taking place, are also being rolled out under the framework of NRHM.

4. Emergency obstetric and new born care

Under NRHM, dedicated 'Maternal and Child Health (MCH) Wing' is being established at high case load facilities in order to expand the health infrastructure for maternal and newborn care, and thus overcome the constraints of limited numbers of beds at health facilities. The MCH Wing, with integrated facilities for advanced obstetric and neonatal care, will not only create scope for quality services but also ensure forty-eight hours stay for the mother and newborn at the hospital

In order to overcome the shortage of specialist doctors who can provide emergency obstetric care, multi skilling of doctors in the public health system is being undertaken. This includes an eighteen week-long training programme of MBBS qualified doctors in Life Saving Anaesthetic Skills (LSAS);a sixteen-week-long training programme in Obstetric Management Skills including Caesarean section; a ten-day-long training for Medical Officers in Basic Emergency Obstetric Care (BEmOC) and a three week- long Skilled Birth Attendance training for ANMs/LHVs / Staff Nurses.

5. Postpartum care for mother and baby

To ensure postpartum care for mothers and newborns, forty-eight hours of stay at the health facility is mandated in case of institutional delivery. MCH wings are being established in high case load facilities to provide quality postnatal care to mothers and newborns. Breastfeeding and hypthermia care are important issues need to be addressed during this period. Prevalence of postpartum depression and psychosis is high and need to be addressed properly through professional involvement.

6. Postpartum IUCD insertion and sterilization

Currently the focus is on placement of trained providers for post-partum IUCD (PPIUCD) insertion at district and sub-district hospital level only, considering the high institutional delivery load at these facilities. Training of Medical Officers in 'Minilap' for provision of Post-Partum Sterilisation in high case load facilities is another such step in this direction. A dedicated RMNCH counsellor is being placed at public sector health facilities under the NRHM.

It is envisioned that the counsellor will play a key role in increasing awareness and generating demand for the various RMNCH services being provided at the facilities. The counsellor will provide counselling services and motivate women to adopt modern or terminal family planning methods.

7. Implementation of preconception and prenatal diagnostic techniques (PC & PNDT) Act

The key areas for action include: formation of dedicated PC&PNDT cells at state/district level, strengthening of human resources as well as trainings and establishing appropriate infrastructure at all levels. States should have a comprehensive communication strategy to address the concerns of the girl child and publicise the provisions of PC&PNDT Act. Establishment of statutory bodies under the PC&PNDT Act (State Supervisory Board, State & District Appropriate Authority, State & District Advisory Committee), strengthening of monitoring mechanisms, including the State Inspection and Monitoring Committee, online maintenance, analysis and scrutiny of records

mandated under the Act and digitalisation of registration records with periodic evaluations are some of the important steps to be taken by the states.

First Referral Units (FRUs) for Comprehensive Emergency Obstetric Care

Under the Child Survival Safe Motherhood Program (CSSM), the First referral units (FRUs) for emergency care were designated to all subdistrict community health centers (CHCs), postpartum centers (PPCs), and upgraded primary health centers (PHCs) of only six states-Assam, Bihar/Jharkhand, Madhya Pradesh/ Chhatisgarh, Orissa, UP/Uttaranchal, Rajasthan initially, then later on to all districts of the country. With the view of establishing an effective obstetric care in the district, the PHCs and subcenters situated in the catchment areas of the FRUs were also strengthened by providing training and equipments.

Package of Services

1. Vacuum extractions;
2. Administration of anesthesia;
3. Blood transfusion;
4. Caesarian section;
5. Manual removal of placenta;
6. Suction curettage for incomplete abortion;
7. Insertion of intrauterine devices; and
8. Sterilization operation, e.g. vasectomy & tubectomy.

Health facilities that can function as FRUs get Kit E to Kit P. The different types of kits are given below:

Kit E Laparotomy set
Kit F Mini-laparotomy set
Kit G IUD Insertion set
Kit H Vasectomy set
Kit I Delivery set
Kit J Vacuum extraction set
Kit K Embryotomy set
Kit L Uterine evacuation set
Kit M Equipment for anesthesia
Kit N Neonatal resuscitation set
Kit O Equipment and reagents for blood test
Kit P Donor blood transfusion set

Other kits such as Kit A, B, and C are supplied to subcenter and Kit D is supplied at PHC. Content of these Kits are as follows:

Kit A: ORS, Tablet Iron and Folic Acid (Large & Small), Vitamin A solution, Tablet Cotrimoxazole (Pediatric)

Kit B: Tablets-Methylergometrine (Inj. also), paracetamol, mebendazole, dicyclamine hydrochloride, Chloramphenicol eye and povidone ointment 5%, cetrimide powder, absorbent cotton, cotton bandage.

Kit C is for ANM and containing all instruments for normal delivery.

Kit D contains all instruments for conducting vaginal delivery and if required episiotomy or forcep can be applied.

There are many schemes for improving Obstetric Care Services for example: Providing additional ANMs, and public health nurses, hiring laboratory technicians and private anesthetists for operation and emergency investigations. For assisting one operation private anesthetists are paid Rs. 1000/-, similarly motherhood consultants can be hired to run a clinic or OPD and Rs. 800/- per day visit may be paid. 24 hours delivery services at PHCs and CHCs have been advocated by providing one medical officer, nurse, and cleaner beyond normal duty hours. Better performing states are given flexibility to spend fund to improve the obstetric care services further.

NEWBORN AND CHILD HEALTH

Neonatal Mortality Rate: The number of deaths in infants under 28 days of age in a given period, usually a year, per 1000 live births in that period.

Perinatal Mortality Rate: In developing countries this is defined as

$$\text{PMR} : \frac{\text{Fetal deaths (28 wks \& above) + postnatal death (1 wks)}}{\text{Fetal deaths (28 wks \& above)+ live births}} \times 1000$$

$$\text{WHO definition} : \frac{\text{Late fetal (28 wks \& above) + Postnatal (1 wks) deaths}}{\text{Live births in a year}} \times 1000$$

It is recommended a more precise formulation (WHO Expert Committee) : "Late fetal and early neonatal deaths weighing over 1000 gram at birth expressed as a ration per 1000 live births weighing over 1000 gram at birth."

Postneonatal Mortality Rate: The number of infant deaths between 28 days and 1 years of age in a given year per 1000 live births in that year. It is an important rate to monitor in developing countries where older infants frequently die of infections and malnutrition.

Infant Mortality Rate (IMR): A measure of the yearly rate of deaths in children less than one year of age. The denominator is the number of live births in the same year.

Child Mortality Rate: Number of deaths to children in age 0-4 years per 1,000 child population (0-4 years) in a given year.

Trends in child mortality

Global

There was not much impact on child survival before second half of the 20th century. Overall number of under five children who die in the world each year fell from 13 million in 1980 to an estimated 10.8 million by the end of 20th century. Globally, the under five mortality rate declined from 159 in 1955 to 70 per 1000 lives births in 1999; a significant reduction by more than half within a span of four decades. The decline was most rapid during 1970s and 1980s. The rate of decline slowed during 1990s and child mortality decreased only by about 15 percent during that decade. Slow trends partly reflects the fact Europe, Americas, Western Pacific and Eastern Pacific has already achieved lower rates. Stagnation in decline also reflects failure to make progress in sub-Saharan Africa and Southeast Asia. In fact, in a few countries, notably those in Southern Africa, where AIDS is taking its greatest toll, child mortality rate has stagnated and even begun to increase. Child mortality is distributed in an extremely uneven manner. Not only between regions and countries but also within countries. Socioeconomic inequities and gender, to a large degree, determine which children live and which die.

There is inequity in child health, which reflects in terms of under five mortality in the world. The under five mortality rate is 7, 88, and 120 in the industrialized, developing and poor countries respectively. The difference is also observed among poor and rich quintile of the populations. Effective interventions are available and can be applied in various states of life cycle of a human being (Figure 8.3).

India

The Under five mortality rates including infant, neonatal and child mortality rates, started declining since the late 1970s and until 1993 the decline was substantial. The decline was however slow during 1993-1998. The level of IMR declined from about 220 deaths per 1000

Figure 8.3: Newborn care intevention

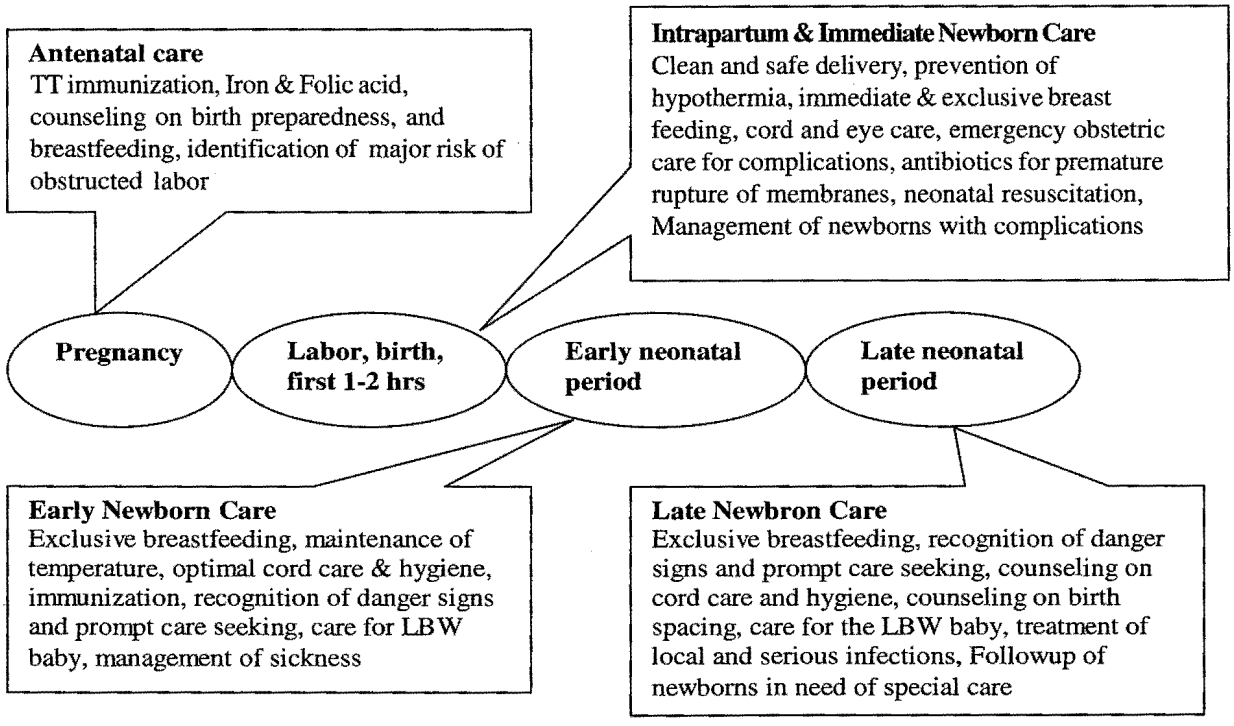
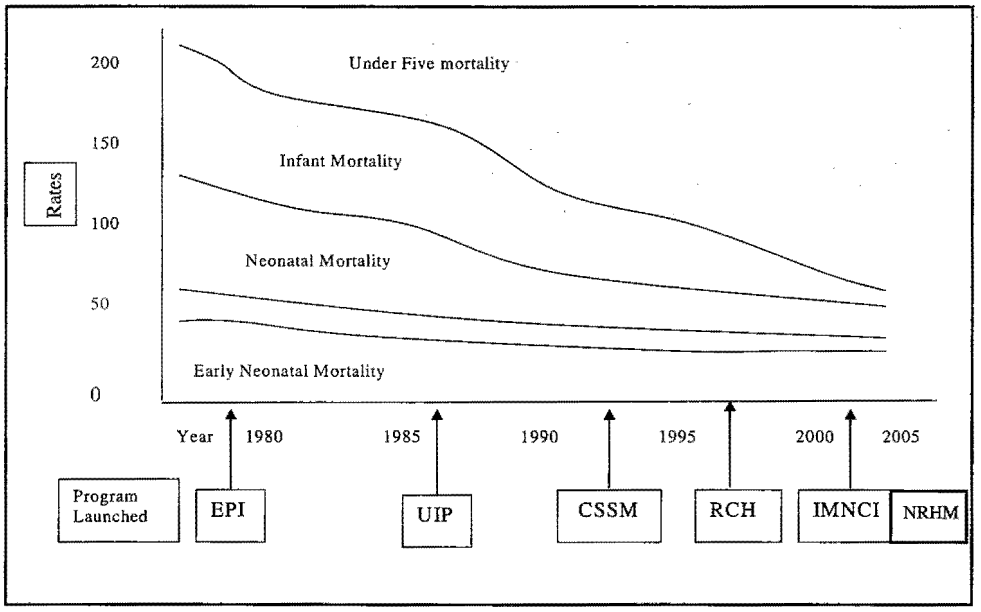

Antenatal care
TT immunization, Iron & Folic acid, counseling on birth preparedness, and breastfeeding, identification of major risk of obstructed labor
Intrapartum & Immediate Newborn Care
Clean and safe delivery, prevention of hypothermia, immediate & exclusive breast feeding, cord and eye care, emergency obstetric care for complications, antibiotics for premature rupture of membranes, neonatal resuscitation, Management of newborns with complications
Pregnancy
Labor, birth, first 1-2 hrs
Early neonatal period
Late neonatal period
Early Newborn Care
Exclusive breastfeeding, maintenance of temperature, optimal cord care & hygiene, immunization, recognition of danger signs and prompt care seeking, care for LBW baby, management of sickness
Late Newbron Care
Exclusive breastfeeding, recognition of danger signs and prompt care seeking, counseling on cord care and hygiene, counseling on birth spacing, care for the LBW baby, treatment of local and serious infections, Followup of newborns in need of special care

Figure 8.4: Trend of childhood mortality rates in India (1980-2005)



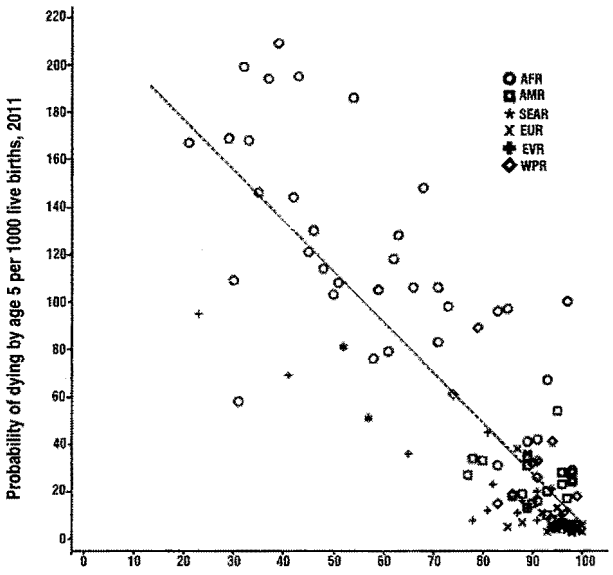
live births per year at the time of independence of India to about 130 during 1960s and remained stable at the same level for a decade. It started declining further after 1978. The momentum of decline continued until 1993. The rate was halved during 1978-1993. The lowest decline was noticed in 1992-1997. The IMR was found to be stagnating at around 72-74 per 1000 live births during 1992-1997 and this was followed by slow pace of decline. Since 1978 the Government of India has put in substantial resources for child survival through various national programs (Figure 8.4).

BCG program was launched in 1962 but program such as EPI was started in 1978, UIP in 1985, CSSM program in 1994, RCH-I in 1998 and RCH-2 and NRHM in 2005, have tried to aid in reduction of child mortality in India.

Determinants of Child Mortality

High child mortality in India is due to multiple factors and their interaction. For example, female primary education has direct impact on child mortality as analyzed on global data from 1990-99 (Figure 8.5). These determinants include social, economic, biological, and demographic factors (Figure 8.6). The factors can be categorized into maternal factors, environmental contamination with infectious agents, nutrients deficiencies, injuries, and personal illness. The causes of mortality among under five children from

Figure 8.5: Female Primary Education and Child mortality



42 countries which account 90% of all deaths, are neonatal disorders, pneumonia, diarrhoea and measles. Low birth weight and undernutrition are the most important risk factors of child mortality. The first few days and weeks of life are the most vulnerable for an infant.

Figure 8.6: Important Determinants of Child Mortality

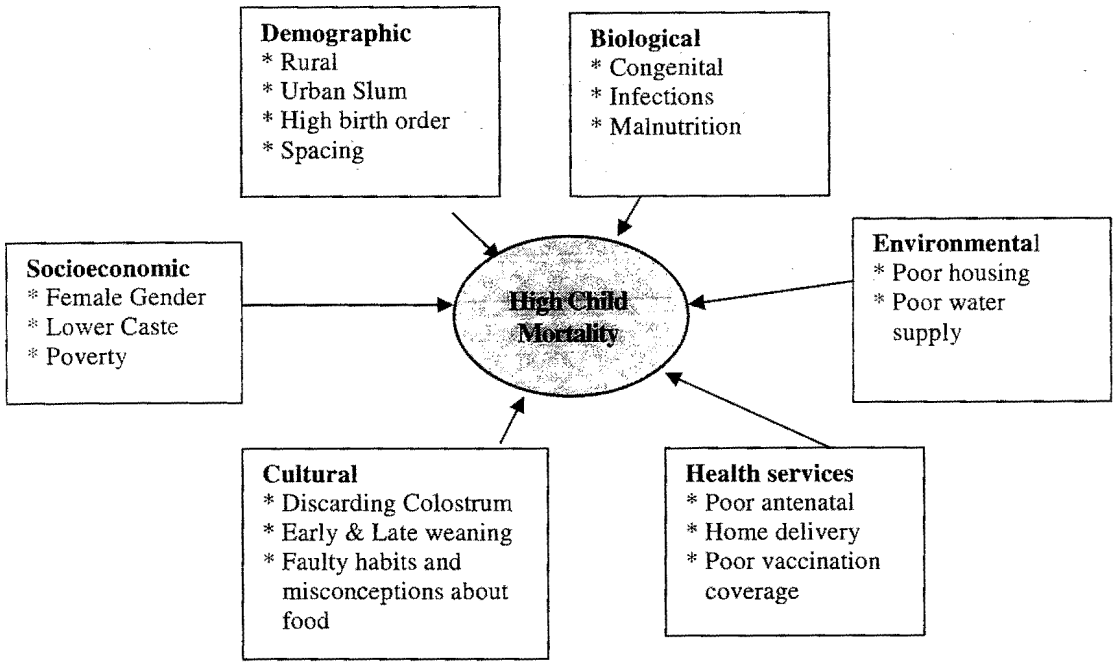


*Table 8.5: Timing of under-5 child deaths**

Age completed	Under-5 child deaths (cumulative)
Day 1	20%
Day 3	25%
Day 7	37%
Day 28	50%
1 year	75%
5 years	100%

*Extrapolated from data from an ICMR study (2003).

A recent ICMR study at 5 rural sites showed that a quarter of under-5 child mortality occurs by day 3 (Table 8.4). The challenge for RCH II is to accelerate the reduction in childhood mortality to reach the national and Millennium Development goals. The National Health policy 2002 had aimed to reduce IMR to 30 per 1000 live births by the year 2010 and to reduce neonatal mortality rate (NMR) to below 20 per 1000 live births by 2010.

IMR has declined in both urban and rural areas. Higher rates of antenatal, delivery and post natal care are usually being associated with lower infant mortality. The principal causes of Infant Mortality Rate (IMR) are:

Prematurity	51%
ARI	17%
Diarrhea	04%
Congenital malformation	05%
Cord infection	02%
Birth injury	03%
Unclassified	18%

Major Milestones in Child Health

One of the most sensitive indicators of measuring the state of child health is the Infant Mortality Rate (IMR). It is the number of deaths of children who are under one year of age per thousand live births. In India the IMR is currently 42/1000 live births as per the Sample Registration System (SRS) 2013 of the office of the Registrar General of India. It has to be brought down to 30 per thousand live births by 2012 as per the National Rural Health Mission (NRHM) but it is not achieved.

Overall in RCH, child health is seen as a continuum of maternal care and interventions for maternal and child health is inextricably interlinked in implementation.

RMNCH A Plus strategy

Priorities are as follows:

1. Home-based newborn care and prompt referral
2. Facility-based care of the sick newborn

3. Integrated management of common childhood illnesses (diarrhoea, pneumonia and malaria)
4. Child nutrition and essential micronutrients supplementation
5. Immunisation
6. Early detection and management of defects at birth, deficiencies, diseases and disability in children (0–18 years).

1. Home based newborn care and prompt referral

The home-based newborn care scheme, launched in 2011, provides for immediate postnatal care (especially in the cases of home delivery) and essential newborn care to all newborns up to the age of 42 days. Frontline workers (ASHAs) are trained and incentivised to provide special care to preterms and newborns; they are also trained in identification of illnesses, appropriate care and referral through home visits. Kangaroo mother care can include early and continuous skin-to-skin contact, breastfeeding, early discharge from the health-care facility and supportive care.

2. Facility-based care of the sick newborns

To strengthen the care of sick, premature and low birth weight newborns, Special Newborn Care Units (SNCU) have been established at District Hospitals and tertiary care hospitals. SNCUs, with provision of advanced care for sick newborns, must serve as the referral centre for the entire district and for their optimum utilisation this information must be available at all peripheral health facilities. Referrals from peripheral units and admission of 'out born' sick newborns to SNCUs should be monitored closely. The goal is to have one SNCU in each district of the country. Another smaller unit known as the Newborn Stabilisation Unit (NBSU), which is a four-bedded unit providing basic level of sick newborn care, is being established at Community Health Centres/First Referral Units. Provision of newborn care at these units increases the chances of survival for babies with health conditions requiring observation and stabilisation soon after birth or in the period thereafter.

Sick newborns discharged from health facilities should be followed up for Developmental Screening and Early Intervention and also provided special care or treatment required by them (for instance, for Retinopathy of Prematurity). During these follow ups, counseling on exclusive breastfeeding, complementary feeding, monitoring of survival, growth monitoring, and screening for neuro-developmental disorders (such as visual, hearing) must be included

3. Child nutrition and essential micronutrients supplementation

Line listing of babies born with low birth weight must be maintained by the frontline workers (ANMs and ASHAs) and their follow up should be ensured so that mothers are supported for optimum feeding and child care practices, and growth faltering is detected early on. A policy decision has been to provide bi-weekly iron and folic acid supplementation for preschool children of 6 months to 5 years as part of the National Iron + initiative. ASHAs will be incentivised to make home visits and to provide at least one dose per week under direct observation and educate the mothers about benefits of iron supplements and also how to administer it.

In addition, there is a provision for (1) weekly supplementation of iron and folic acid for children from 1st to 5th grades in government and government-aided schools and (2) weekly supplementation for 'out of school' children (6–10 years) at Anganwadi Centres. In order to reduce the risk of mortality in children with severe acute malnutrition, Nutritional Rehabilitation Centres (NRCs) have been established for providing medical and nutritional care. NRCs play a crucial role in promoting physical and psychosocial growth of children with severe under-nutrition. These units can be established at the District Hospitals or FRUs, depending upon the availability of infrastructure and human resources as well as the accessibility of the facility to the surrounding areas.

4. Integrated management of common childhood illnesses (pneumonia, diarrhoea and malaria)

Integrated Management of Neonatal and Childhood Illnesses (or IMNCI) and is provided at all levels of care: at community (ASHA package), first level care (IMNCI) and referral level care (F-IMNCI). IMNCI

addresses various aspects of child nutrition, immunization, and elements of disease prevention and health promotion. Its three main components include: improvements in the case-management skills of health staff, improvements in the overall health system required for effective management of neonatal and childhood illnesses, and improvements in family and community healthcare practices (Details about IMNCI is given later in this chapter).

Availability of ORS and Zinc should be ensured at all sub-centres and with all frontline workers. Use of Zinc should be actively promoted along with use of ORS in the case of diarrhoea in children. Use of recommended antibiotics (based on national guidelines) in children aged 2 months to 5 years with non-severe pneumonia must be ensured through frontline workers (ASHA, ANM) and at all levels of health facilities. Timely and prompt referral of children with fast breathing and/or lower chest in-drawing should be made to higher level of facilities. Emergency management of children with pneumonia is included in the facility-based IMNCI trainings

5. Immunisation

Universal Immunisation Programme includes vaccines to prevent seven vaccine preventable diseases (Tuberculosis, Polio, Diphtheria, Pertussis, Tetanus, Measles, Hepatitis B). Japanese Encephalitis (JE vaccine) vaccine has been introduced in endemic districts in a campaign mode and also incorporated into the Routine Immunization Programme. The second dose of measles has been introduced and Hepatitis B vaccine is now available in the entire country. Pentavalent vaccine, a combination vaccine(DPT + Hep-B + Hib),first introduced in two states (Kerala and Tamil Nadu), is now being expanded to six states and will eventually be scaled up to cover the entire country (Details about IMNCI is given later in this chapter).

6. Child Health Screening and Early Intervention Services (Rashtriya Bal Swasthya Karyakram)

There are no nationally representative data on time trends of incidence of obesity, diabetes and hypertension in children. State/UT-wise data are not available.

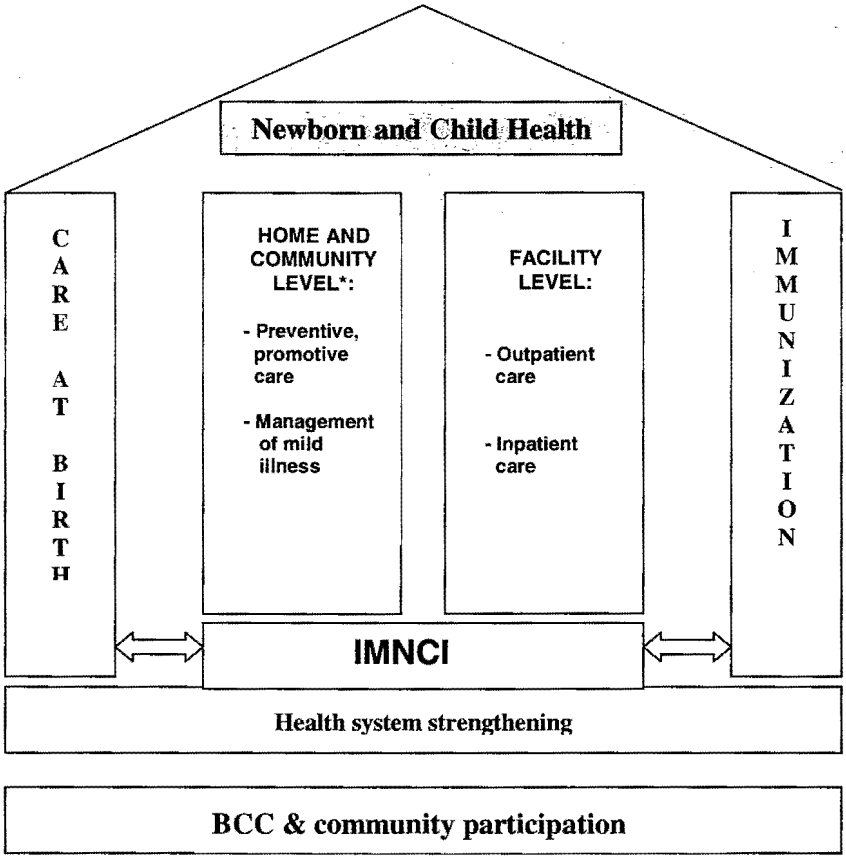
However, as per the reports of few cross sectional studies, prevalence of childhood obesity appears to be increasing in India.

In an Indian Council of Medical Research (ICMR) sponsored study, conducted among 24000 school children in South India the proportion of overweight children increased from 4.94% of the total children in 2003 to 6.57% in 2005. Prevalence of incident hypertension in normal weight, overweight and obese group of children was 10.1%, 17.34% and 18.32% respectively.

The Government of India under National Health Mission has launched Rastriya Bal Swasthya Karyakram (RBSK) in February, 2013 in order to improve the overall quality of life of children and provide comprehensive care to all the children in the community including school children. This programme involves screening of children from birth to 18 years of age for four Ds - Defects at birth, Diseases, Deficiencies and Development delays including disabilities. Children diagnosed with identified health conditions will receive follow-up care including early intervention services at the district level including surgeries at tertiary level, free of cost under National Health Mission.

Child Health Screening and Early Intervention Services cover 30 common health conditions for early detection and free treatment and management. The child health screening services are built on the existing school health services and are provided through dedicated mobile health teams placed in every block. The block level dedicated mobile medical health teams comprise of four health personnel viz. two AYUSH doctors (One Male, One Female), ANM/ SN, and a Pharmacist. The teams carries out screening of all the children in the age group 0 – 6 years enrolled at Anganwadi centres atleast twice a year besides screening of all children enrolled in Government and Government aided schools. The new-borns are screened for birth defects in health facilities where deliveries take place and during the home visit by ASHA.

Figure 8.7: IMNCI strategy under RCH-II



*Also linked to post-partum care of the mothers

At present, there are 6815 RBSK mobile teams and 7.99 crore children were screened and 43.1 lakh children were referred during the financial year 2013-14. A total of Rs. 1176.37 crores were allocated during 2013-14 for implementation of this programme.

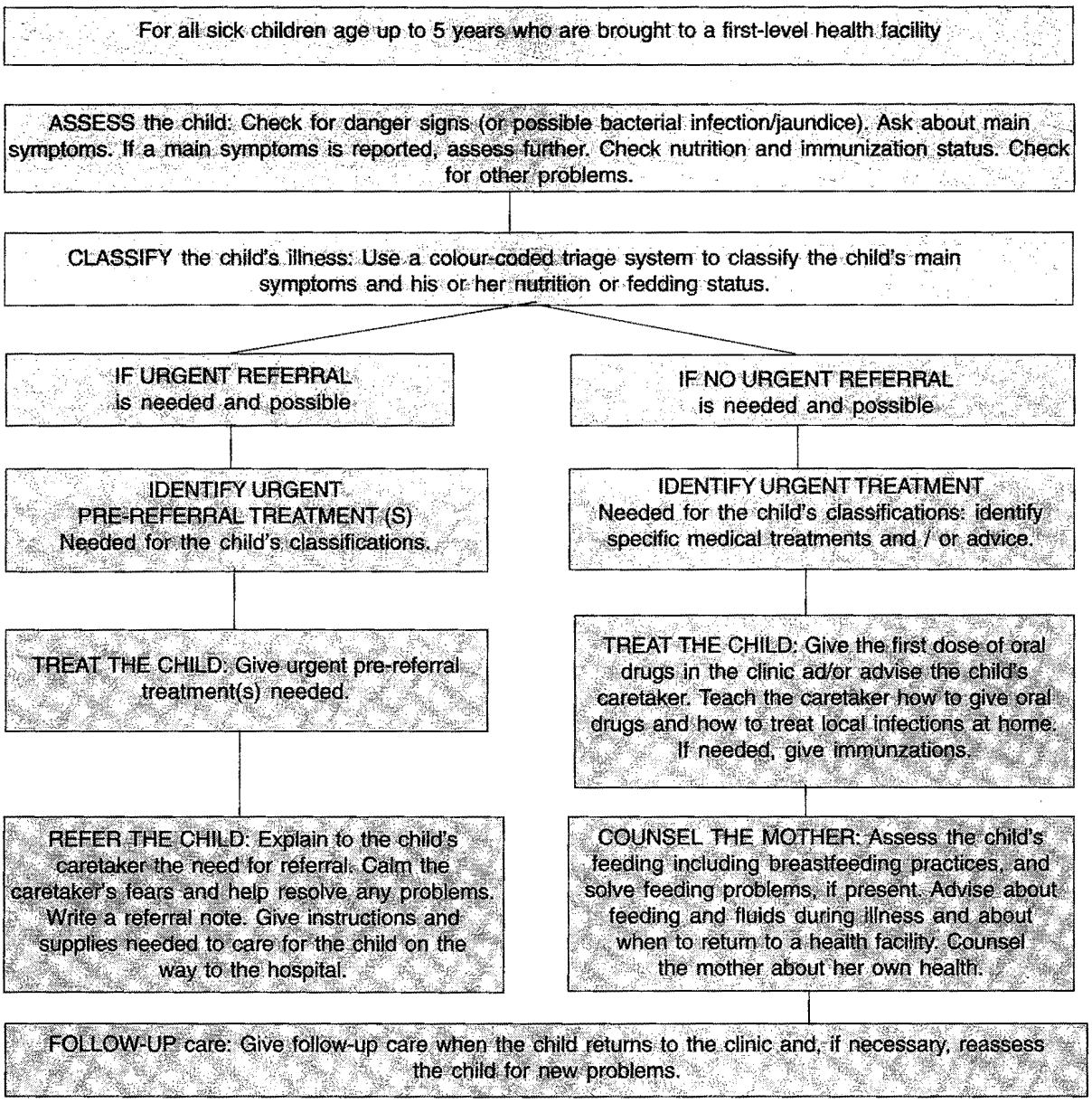
As per Ministry of Human Resources and Development, The Jawahar Navodaya Vidyalayas and Kendriya Vidyalayas which are under the administrative control of Government of India provide for a staff nurse on the school premises to handle medical emergency including administering first aid. These schools also provide for services of a doctor on part time basis. The Guidelines issued to States/ UTs emphasize the safety and security aspect of children. In addition, the Mid Day Meal(MDM) Guidelines also envisage that children studying in Government and Government aided schools are to be covered under Rashtriya Bal Swasthya Karyakram (RBSK) in convergence with the National Health Mission. The children are screened by the medical teams of the State Health Department on half-yearly basis. Under RBSK, height and weight of the children is also measured by the medical team.

INTEGRATED MANAGEMENT OF NEONATAL AND CHILDHOOD ILLNESS (IMNCI)

Integrated Management of Childhood and Neonatal Illness (IMNCI) strategy encompasses as range of interventions to prevent and manage five major childhood illnesses i.e. Acute Respiratory Infections, Diarrhea, Measles, Malaria and Malnutrition and the major causes of neonatal mortality such as prematurity and sepsis. In addition IMNCI teaches about nutrition including breast-feeding promotion, complementary feeding and micronutrients. It focuses on preventive promotive and curative aspects, i.e. it gives a holistic outlook to the program.

The Major components of the this strategy are:
1) Strengthening the skills of the health care workers

Figure 8.8: Flow of patients in the system


For all sick children age up to 5 years who are brought to a first-level health facility
ASSESS the child: Check for danger signs (or possible bacterial infection/jaundice). Ask about main symptoms. If a main symptoms is reported, assess further. Check nutrition and immunization status. Check for other problems.
CLASSIFY the child's illness: Use a colour-coded triage system to classify the child's main symptoms and his or her nutrition or fedding status.
IF URGENT REFERRAL is needed and possible
IF NO URGENT REFERRAL is needed and possible
IDENTIFY URGENT PRE-REFERRAL TREATMENT (S) Needed for the child's classifications.
IDENTIFY URGENT TREATMENT Needed for the child's classifications: identify specific medical treatments and / or advice.
TREAT THE CHILD: Give urgent pre-referral treatment(s) needed.
TREAT THE CHILD: Give the first dose of oral drugs in the clinic ad/or advise the child's caretaker. Teach the caretaker how to give oral drugs and how to treat local infections at home. If needed, give immunzations.
REFER THE CHILD: Explain to the child's caretaker the need for referral. Calm the caretaker's fears and help resolve any problems. Write a referral note. Give instructions and supplies needed to care for the child on the way to the hospital.
COUNSEL THE MOTHER: Assess the child's feeding including breastfeeding practices, and solve feeding problems, if present. Advise about feeding and fluids during illness and about when to return to a health facility. Counsel the mother about her own health.
FOLLOW-UP care: Give follow-up care when the child returns to the clinic and, if necessary, reassess the child for new problems.

2) Strengthening the health care infrastructure
3) Involvement of community

IMNCI is the Indian adaptation of the WHO-UNICEF generic IMCI (Integrated Management of Childhood Illness) where neonatal care has been added.

Strategy

The mission in RCH II is to translate this knowledge into action and usher in the second child survival revolution in the country. The following principles will govern the planning and implementation of newborn and child health strategies:

- Evidence-based interventions.
- Approach integrated with RCH program.
- Equity-driven implementation and monitoring.
- Rational mix of community and facility-based interventions.
- Phased decentralized priority setting at state and district levels.
- Participation of the private sector.

Figure 8.9: Flow chart of Line of action a health worker has to adopt on observing a sick child

OPD health facility

Check for danger signs

* convulsions * Lethargy/unconsciousness
* Inability to drink/breastfeeding * Persistent vomiting

|

Assess Main Symptoms

* Cough or difficult breathing * Diarrhea
* Fever * Ear Problems

|

Assess Nutrition and immunization status and Potential Feeding Problems

|

Check for other problems

|

Classify conditions and Identify Treatment

|

Actions According to Color coded treatment

Pink	Yellow	Green
Urgent referral	Treatment at OPD	Home management
	Treat local infection	Care includes counseling on:
	Give oral drugs	Home treatment(s);
	Advice and teach care	Feeding and fluids;
	Keep baby warm	Keep baby warm
	Followup	When to return immediately; Followup

Referral Facility

* Emergency Triage & Treatment (ETAT)
* Diagnosis
* Treatment
* Monitoring and Followup

IMNCI-PLUS

The package of Integrated Management of Neonatal and Childhood Illnesses also consists of immunization, care at birth and BCC (Figure 8.7). IMNCI adapted and under early implementation in India takes the generic IMCI approach much further - by including 0-6 days of age group, by having a health worker module, and by incorporating the home-based approach for newborn care. But there is a need to add the inpatient care component for facilities to ensure effective care of sick neonates and children who require hospitalization. This is done by adapting WHO and local guidelines and tools. Even in this comprehensive form, IMNCI package is still not cover the vital care of the neonates at birth in home and facility settings. Further, the IMNCI approach includes counseling for immunization, but the implementation of immunization in India is largely a periodic outreach activity and that cannot be adequately captured by the IMNCI contacts alone. Therefore, a comprehensive immunization plan is an additional pillar of the newborn and child health strategy. Health system inputs and community level activities are germane to the effectiveness of not only IMNCI, but also that of care at birth, as well as successful immunization strategies. It is in the light of the above reasons that the newborn and child health strategy for RCH it is named as 'The IMNCI Plus' strategy to connote the wider, comprehensive range of interlinked interventions that form the newborn and child health component of RCH II program.

Process of IMNCI

When a child fall sick and report to the health facilities or observed by the health worker he/she has to follow set pattern of line of action as given in the figure 8.8 & 8.9.

This approach empowers with the skills of the health worker when she/he see a sick child. The worker should follow the steps as suggested in chart provided in IMNCI. According to this child can be managed at home or referred to higher center immediately in emergency.

Facility Based IMNCI

F-IMNCI is the integration of the facility based care package with the IMNCI package to empower the health personnel with the skills to manage new born and childhood illness at the community level as well as at the facility.

Facility Based IMNCI focuses on providing appropriate inpatient management of the major causes of neonatal and childhood illnesses such as asphyxia, sepsis, low birth weight in neonates and pneumonia, diarrhea, malaria, meningitis and severe malnutrition in children. Master trainers at state level and at the district level are pediatricians from tertiary hospital and medical colleges. This training is being imparted to medical officers, staff nurses and ANMs at CHC/FRUs and 24X7 PHCs where deliveries are taking place.

Newborn corner is a space within the delivery room in any health facility where immediately care is provided to all newborn at birth. This area is mandatory for all health facilities where deliveries are conducted.

NRHM report 2013 stated that there are 13168 NBC corners have been established.

Newborn stablising unit (NBSU): NBSU is a facility wihtin or in close proximity of the maternity ward where sick and low birth weight newborns can be cared for during short periods. All FRUs/CHCs need to have a neonatal stablization unit, in addition to the newborn care corner. 1554 units has been established according to NRHM 2013 report.

Criteria for admission in Special Newborn care Unit (SNBCU)

Any newborn which following criteria should be immediately admitted to the SNCU:

- Birthweight <1800 g or gestation <34 weeks
- Large baby (>4 kg)
- Perinatal asphyxia
- Apnea or gasping
- Refusal to feed
- Respiratory distress (rate >60/min/grunt/retraction)
- Severe jaundice
- Hypothermia <35.4 ^{0}C, hyperthermia >37.5 ^{0}C
- Central cynosis
- Shock
- Coma, convulsion or encephalitis
- Abdominal distension
- Diarrhea /dysentery
- Bleeding
- Major malformation

Criteria for transfer from SNCU to the step down

- Babies whose respiratory distress is improving and do not require oxygen
- Babies on antibiotics for completion of duration of therapy
- Low birthweight babes (less than 1800g) who are otherwise stable.
- Babies admitted for any conditions but are now thermodynamically stable

Criteria for discharge from SNCU to home

- Baby is able to maintain temperature wothout radiating warmer
- Baby is thermodynamically statble
- Baby has documented weight gain for 3 consecutive days and the weight is more than 1.5 kg.
- Primary illness has resolved

In addition to the above, mother should be confident of taking care of the baby at home (Govt. of India 2011). Following observations are made in evaluation of NRHM 2010.

- Facility-based newborn care is however inching forward at a snail's pace.
- In the SNCUs visited, 70% of the case load was from within the hospital, with a 64% mortality – indicative of the challenge of newborn care, even in the best of situations.
- Protocols of care for sick newborns or sick children were almost never seen.

Pre Service IMNCI

Pre service IMNCI has been accepted as an important strategy to scale up IMNCI by GOI and is being included in the curriculum of medical colleges of the country.

DIARRHEAL DISEASE

Burden of Disease in World

Water-related diseases are a growing human tragedy, killing more than 5 million people each year - 10 times the number of people killed in wars. About 2.3 billion people suffer from diseases linked to dirty water. 60% of all infant mortality worldwide is linked to infectious and parasitic diseases and most of them are water-related (UN 2003).

Waterborne diseases

- Those caused by water that has been contaminated by human, animal, or chemical wastes.
- Waterborne diseases include cholera, typhoid, bacillary dysentery, polio, meningitis, hepatitis A and E and diarrhoea, among others. These are diseases caused by dirty or contaminated water, and most can be prevented by treating water before use.
- Every day, diarrhoeal diseases cause some 6,000 deaths, mostly among children under five: in 2001, 1.96 million people died from infectious diarrhoeas; 1.3 million were children under five.
- Between 1,085,000 and 2,187,000 deaths due to diarrhoeal diseases can be attributed to the 'water, sanitation and hygiene' risk factor, 90% of them among children under five.
- In China, India and Indonesia, twice as many people die from diarrhoeal diseases as from HIV/AIDS.
- With simple hygiene measures such as washing hands after using the toilet or before preparing food, most of these deaths can be prevented.

Water-based diseases

- Those caused by aquatic organisms that spend part of their life cycle in the water and another part as parasites of animals.
- Water-based diseases include Guinea worm disease, filariasis (also a vector born disease), paragonimiasis, clonorchiasis and schistosomiasis. These diseases are caused by a variety of flukes, tapeworms, roundworms and tissue nematodes, often referred to as helminths, that infect humans. Although these diseases are not usually fatal they prevent people from living normal lives and impair their ability to work.
- The prevalence of water-based diseases often increases when dams are constructed, because stagnant water behind dams is ideal for snails, the intermediary host for many types of worms. For instance, the Akosombo Dam, on Volta Lake in Ghana and the Aswan High Dam on the Nile in Egypt have resulted in huge increases of schistosomiasis in these areas.

Water-related vector diseases

- malaria, yellow fever, dengue fever, sleeping sickness and filariasis are transmitted by vectors, such as mosquitoes and tsetse flies, that breed or live in or near water.

Water-scarce diseases

- Those diseases that thrive in conditions where freshwater is scarce and sanitation is poor, such as trachoma and tuberculosis.
- To serve the additional 5 billion people expected to live on the planet by the year 2050, sewerage facilities must be provided to 383,000 new customers a day.

These diseases are becoming rampant throughout the world. They can be controlled easily through better hygiene, but adequate supplies of clean freshwater must be available.

India

In India acute diarrheal disease is one of the major consequences of not only water pollution but also of the failure of proper management of sewage in both cities and rural areas. The median diarrheal incidence rate ranges from 1.0 to 4.7 episodes per child per year. In slum areas of major cities the incidence is as high as 10.5 episodes per child per year. About 3 million deaths globally are associated with diarrhea. India alone account for one third of these deaths. Around 65% of deaths are due to dehydration, 20-35% due to persistent diarrhea and remaining 15% due to dysentery. Beside this, there is problem of reemergence of new strains of Cholera, Escherichia and Shigella that need to be tackled properly otherwise nation may face the severe epidemics.

Most of the time the causative agents are bacteria and viruses which are self limiting and do not require antibiotics. Major pathogens involved in diarrheas are given below:

Pathogen	*Organism*	*% of cases*
Virus	Rotavirus	15-25
Bacterial	Escherichia coli	10-20
	Shigella	5-15
	Campylobacter jejuni	10-15
	Vibrio cholerae	5-10
	Salmonella	1-5
Protozoans	Cryptosporidium	5-15
	No pathogen found	20-30

NFHS-3 showed that 10.6% children under the age of six suffered from diarrhoea in the preceding two weeks. 57% were taken to health care provider and 13.7% were given ORS. There is no change seen in use of ORS from NFHS II to III. Almost 99% deaths can be prevented by treatment with Oral Rehydration Salt Solution (ORS). The Oral Rehydration Therapy (ORT) program was introduced in 1986 with the objective to prevent death due to the dehydration. NFHS-3 data is disappointing regarding ORS in diarrhoeal episodes; only 26% coverage and usage of ORS was low among children who had diarrhoea even though most of women (73%) knew about ORS (NFHS-3).

Clinical Presentation

Diarrhea is the passage of loose (liquid or watery) stools more than 3 times a day. Pasty stool in a breast fed baby and passage of a stool during or immediately after feeding should not be considered as diarrhea. Again, a recent change in character of stools is more important. Mothers usually know when their children have diarrhea and often have a local word for diarrhea.

Acute diarrhea may last up to 14 days. If more than 14 days duration and associated with weight loss, it is

considered as *persistent diarrhea*. When diarrhea is associated with growth failure in some cases. But when it is associated with visible blood then it is dysentery.

Chronic diarrhea lasts more than 21 days may be due to noninfectious causes, such as sensitivity to gluten or inherited metabolic disorders. The most common cause of death in diarrhea is dehydration, that is why its treatment with fluid replacement save lives. Only in some cases antibacterial or antiparasitic antibiotics is required.

Diarrhea can cause under nutrition and worsen milder forms of malnutrition because:

- Impaired intestinal absorption causes loss of macro and micronutrients (e.g. Zinc) in diarrhea,
- Urinary loss of specific nutrients are increased e.g. Vitamin A
- There is increased catabolism due to infection,
- Mothers often make the mistake of not feeding enough food to a child while he or she has diarrhea or even for some days after the child is better, and
- Doctors often do not give sufficient emphasis on the need for continued feeding during diarrhea or to correct feeding practice when it was faulty prior to illness.

Signs of dehydration: Two or more signs including one marked (*) should be present:

1. Increased thirst*,
2. Restlessness, irritability*,
3. Decreased skin turgor*,
4. Dry mouth and tongue,
5. Absence of tears,
6. Sunken eyes

Signs of severe dehydration: Two of the following signs should be present:

1. Lethargic or unconscious,
2. Unable to drink,
3. Floppy (loss of muscle tone),
4. Sunken eyes,
5. Skin pinch gone back very slowly.

DIARRHEA CONTROL PROGRAM AND ORS PROGRAM

The best treatment for dehydration is Oral Rehydration Therapy by Oral Rehydration Salt (ORS) solution. The new improved formula is the result of extensive research sponsored by WHO's Department of Child and Adolescent Health and Development and supported by the United States Agency for International Development (USAID). The latest study's findings suggest that using the low-sodium,

Table 8.6: Treatment Plan-A to Treat Diarrhea at Home

Age	Amount of ORS given after each loose stool at home	Amount of ORS to be provided for use
< 2 yrs	50-100 ml	500 ml/day
2-10 yrs	100-200 ml	1000 ml/day
10 or above	As much as wanted	2000 ml/day

Describe and show the amount to be given after each stool using a local measure. If ORS is not available then Home Available Fluid (HAF) can be used.

Treatment Plan-B to Treat Dehydration

Approximate amount of ORS solution to be given in the 4 hours.

Age	<4 month	4-11 month	12-23 month	2-4 yrs	5-14 yrs	15 yrs or above
Weight	<6 Kg	6-<10 Kg	10-<12 Kg	12-19 Kg	20-<30 Kg	30 or more kg
Amt. in ml	200-400	400-700	700-900	900-1400	1500-2200	2200-4000
Glass	1-2	2-3	3-4	4-6	6-11	11-20

- If weight of the child is very low then give first dose of I/M ampicillin or gentamycin and refer to higher center/pediatrician;
- Continue breast feeding;
- After 4 hours of treatment, reassess the child clinically and then select Plan-A/B/C to continue.
- Instruct the mother to keep warm on the way to hospital;
- If the child vomits, the mother should be asked to wait for 10 minutes and then advised to continue, but more slowly.

Table 8.7: Treatment Plan-C to Treat Severe Dehydration Quickly

Start IV fluid immediately. If the patient can drink, give ORS by mouth while the drip is set up. Give 100 ml/Kg Ringer's lactate solution (or if not available, normal saline) divided as follows:

Age	First give 30 ml/Kg in	Then give 70 ml/Kg in
Infant	One hour	Five hours
Older	30 Minutes	Two and a half hours

- Repeat once if radial pulse is still very weak or not detectable.
- Reassess the patient every 1-2 hours, if hydration is not improving, give IV drip more rapidly
- If IV fluid is not available or you can't start then refer the child to higher center or nearby health care facility wherever IV drip can be set within 30 minutes.
- If weight of the child is very low then give first dose of IM ampicillin or gentamicin and refer to higher center/ pediatrician;
- Continue breast feeding;
- Instruct the mother to keep the baby warm on the way to hospital

low-glucose and reduced osmolarity ORS formulation reduces the need for intravenous fluids by 33 percent. The effect of this reduction could result in fewer children requiring hospitalization, fewer secondary infections, a diminished need to handle blood with its potentially dangerous consequences, and lower health care costs (WHO 2002).

The Composition of ORS for one liter water is as follows:

Constituents	*Composition g/L*
1) Sodium Chloride	2.6
2) Potassium Chloride	1.5
3) Sodium Citrate	2.9
4) Glucose anhydrous	13.5
Total Weight is	*20.5*

Various studies proved that the reduced osmolarity ORS solutions (osmolarity 210-268 mOsm/l, sodium 50-75 mEq/l) reduce stool output by about 20% and the incidence of vomiting by about 30%. The 245 mOsm/l solution also appeared to be as safe and at least as effective as standard ORS for use in children with cholera. The total substance concentration (including that contributed by glucose) should be within the range of 200-310 mmol/l as recommended by WHO and UNICEF. Individual ingredient of ORS should be as follows:

Ingredient	*mmol/L*
Glucose	111
Sodium	60-90
Potassium	15-25
Citrate	8-12
Chloride	50-80

Treatment plans for diarrhea with dehydration

Treatment plan according to severity of dehydration has been suggested by WHO. Mild dehydration with diarrhea can be treated at home by Plan A and in case of some dehydration plan B can be used. In case of severe dehydration Plan C can be used (Table 8.6 & 8.7).

Zinc with ORS

WHO and UNICEF have recommended Zinc supplement in acute diarrhea. Zn causes 27% reduction in the duration of diarrhea and 24% reduction in stool volume. All cases of diarrhea should receive zinc in addition to ORS. A uniform dose of 20 mg of elemental zinc should be given to all children 6 months and older and should be started as soon as diarrhea starts and continued for a total period of 14 days. Children aged 2 months up to 6 months should be advised 10 mg per day of elemental zinc for a total period of 14 days.

- Based on all the studies, any of the zinc salts e.g. sulphate, gluconate or acetate may be recommended.
- Dispersible tablets or syrup can be used. Dispersible tablets can be stored and transported easily. They can be dissolved in breast milk or water before use.
- Iron containing formulations should not be used with zinc as iron interferes with zinc absorption.

Other rehydration Therapy

i) Sugar salt solution (SSS): A mixture of sugar (sucrose) and salt (sodium chloride), to provide a final concentration of 4% sugar, 0.4% salt, makes an excellent rehydration solution and is an effective replacement when ORS is not available.

ii) Food-based solutions: Food based solutions are those that are commonly used in homes and have a sound physiological basis (i.e. contain acceptable

concentrations of starch and sodium). Examples are rice water, dal or dal water with salt, butter milk (lassi) with salt and certain soups with salt.

iii) Home Available Fluids (HAF): In absence of ORS, HAF are appropriate for a child who does not show any signs of dehydration. It should be given frequently and after every loose stool to prevent dehydration. HAF could be rice water, *dal* or *dal* water with salt, and butter milk (*lassi*) with salt, lemon water, soups, coconut water, rice *kanji*, or just plain water. These fluids are generally more effective when given along with food (i.e. feeding should be continued).

For persistent diarrhea give first dose of intramuscular ampicillin/gentamicin if weight of the baby is very low. Treat the low blood sugar if present, and advice the mother to keep the baby warm on the way to hospital. For dysentery give first dose of ampicillin and gentamicin if young infant has low weight. Antidiarrheal (anti-motility drugs, binding agents, stimulants, steroids, purgatives, and other drugs) have no place in the treatment of diarrhea and must not be used under any condition.

Recommendations for dietary management of Acute Diarrhea

- Children should continue to be fed during acute diarrhea because feeding is physiologically sound and prevents or minimizes the deterioration of nutritional status that normally accompanies such illness.
- In acute diarrhea, breast feeding should be continued uninterrupted even during rehydration with ORS.
- Optimally energy dense foods with the least bulk that are recommended for routine feeding and available in the household should be offered during diarrhea, in small quantities but frequently, at least once every 2-3 hours.
- Staple foods do not provide optimal calories per unit weight and these should be enriched with fats and oils or sugar e.g. khichri with oil, rice with milk or curd and sugar, mashed banana with milk or curd, mashed potatoes with oil and lentil.
- Foods with high fibre content e.g. coarse fruits and vegetables should be avoided.
- In non-breast fed infants, cow or buffalo milk can be given undiluted after correction of dehydration together with semisolid foods. Milk should not be diluted with water during any phase of acute diarrhea. Alternatively, milk cereal mixtures e.g. dalia, sago, milk-rice mixture, can be used.
- Routine lactose-free feeding e.g. soy formula is not required during acute diarrhea even when reducing substances are detected in the stools. Lactose malabsorption meriting dietary modification is very uncommon in acute diarrhea. It may be required in very few infants in whom diarrhea persists beyond 8-10 days with progressive weight loss and > 1 percent reducing substances in stools.
- During recovery, an intake of at least 125% of normal should be attempted with nutrient dense foods; it should continue until the child reaches pre-illness weight and ideally until the child achieves normal nutritional status, as measured by expected weight for height or weight for age. This might take several weeks or longer, depending on the degree of deficit.

COMMENTS

Use of ORS is decreasing as seen in NFHS-3 and 2. The program should focus on safety of water being delivered to homes for consumption. Hand hygeine and sanitation is also promoted in the program. Village health nutrition and sanitation committee has been formed at the village level where emphasis is on convergence of various programs. Focus should be on improvement of sanitation in village. There are studies showing that home based water chlorination has no extra benefit in decreasing episodes of diarrhea (Boisson S, et al 2013). Therefore comprehensive sanitation program need to be developed. Zinc is recommended by the World Health Organization and UNICEF as part of diarrhea therapy for all children aged <5 years. Zinc has benefits for the subsequent 2-3 months in decreasing the prevalence of diarrhea and has been shown to help children maintain their weight and to improve growth in the weeks after an episode. Beneficial effect is found in older children than in children less than 6 months (Walker et al 2007). This has been suggested that zinc ORS should be used in areas where polio is still a problem because that will decrease the diarrhea and improve the resistance against polio.

ACUTE RESPIRATORY INFECTIONS (ARI)

Acute Respiratory Infection (ARI) is one of the most

common causes of deaths in under 5 years of age group contributing around 13% of inpatient deaths in pediatric wards. ARI, mainly lower respiratory tract infections ("pneumonia") are a major cause of death in children, accounting for about 30% of under-five deaths. NFHS III data shows that 5.8% children under the age of 6 years experienced cough with fast breathing (indicating lower respiratory tract infection) during the two weeks preceding the survey. NFHS -3 showed that 69% of children who had ARI/Fever were taken to health facility and 12% recieved antibiotics. Timely treatment based on well-researched algorithms can save most children with ARI. The pilot project was initiated in 1990 and since 1992, the ARI control program became a part of the CSSM (now RCH) program. Treatment of acute respiratory infection is very simple and can be instituted at home itself or at subcenter level.

Risk factors for Acute Lower Respiratory Tract Infection in underfives (Broor 2001) are lack of breast feeding, upper respiratory infection (URI) in mother or siblings, cooking fuel other than LPG, inappropriate immunization for age and history of lower respiratory tract infection in the family. Acute Respiratory Tract Infection (ARI) is an acute infection of any part of the respiratory tract and related structures including paranasal sinuses, middle ear and the pleural cavity. It includes all infections of less than 30 days duration except those of the middle ear where the duration of an acute episode is less than 14 days.

Acute Respiratory tract Infection is often classified into Acute Upper respiratory tract infection (AURI) including common cold, pharyngitis and otitis media or Acute Lower (ALRI) Respiratory 7Tract Infection including epiglottitis, laryngitis, bronchitis, bronchiolitis and pneumonia. It is diagnosed on the basis of sign and symptoms. The simplified way of diagnosis and appropriate management, which can be given in field conditions, is given in Table 8.8.

BREAST-FEEDING

There are various terms associated with breast-feeding and must be understood (Kishore 2013) such as:

Exclusive Breast-feeding: Breast Milk including milk expressed or from a wet nurse. It allows ORS, drops, syrups (vitamins, minerals, medicines).

Almost Exclusive Breast Feeding: Water, drugs, Vitamins, and ritual feeds are allowed into infant's mouth in addition to breast milk.

Predominantly Breast-fed: Breast milk and water, sweetened water, juices, and teas.

High Partial: More than 80% of infant feeds are breast-feeds.

Medium Partial: Only 20-80% of infant feeds are breast-feeds.

Low Partial: Less than 20% of infant feeds are breast feeds.

Token Feeding: Breast feeding from either one or both the breasts for less than 15 minutes per day, only to console the baby who is crying.

Non-breast-fed: No breast milk.

Colostrum: Thick yellowish secretion which is secreted from the breast within the first week of life

Prelacteal Foods: Any fluid or food given before colostrum

Postlacteal Food: Fluid or food given after breast-feeding has started (within 3 days of birth)

Baby Friendly Hospital Initiative

WHO recommends exclusive breast-feeding for the first 6 months. The ***Baby Friendly Hospital Initiative*** launched in 1992, aims at promoting successful breast-feeding in the facilities where deliveries take place. Every year breasfeeding week during 1-7th August is celebrated to highlight the importance of breastfeeding.

Ten steps to successful breastfeeding

Every facility providing maternity service and care for newborn infants should:

1. Have a writen breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within a half hour of birth.
5. Show mothers how to breastfeed, and how to maintain lactation even if they should be separated from their infants.
6. Give newborn infants no food or drink other than breast milk unless medically indicated.
7. Practice rooming in allow mothers and infants to remain together 24 hours a day.
8. Encourage breast feeding on demand.
9. Give no artificial teats or pracifier (also called dummies of soothers) to breastfeeding infants.
10. Foster the establishment of breastfeeding support

Table 8.8 : Management of Acute Respiratory Tract Infection

Classification		Therapy	Where to treat
No Pneumonia		Symptomatic/home remedy	At home
Pneumonia		Tab.Cotrimoxazole oral* (Sulphmethoxazole100mg & Trimethoprim 20 mg) for 5 days	At home or health facility
Age in Month	Resp Rate per minute		
<2	≥60	One Tablet BD	
2-12	≥50	Two Tablets BD	
12-60	≥40	Three Tablet BD	
Severe Pneumonia Chest in-drawing		Antibiotics IM Injection Benzyl Penicillin. 50000IU/Kg/Dose 6 hourly or Inj. Ampi (50mg/Kg/Dose + Genta 2.5 mg/Dose) 8 hourly	Patients should be Hospitalized
Very Severe Pneumonia • Inability to drink • Excessive Drowsiness • Stridor in calm child • Respiratory Grunting • History of apnea / cyanosis / Convulsion • Severe Malnutrition • Hypothermia		Chloramphenical orally or IM 25 mg/Kg/Dose 6 hourly	Must always be admitted & treated at health facility with provision of oxygen

• Pediatric Syrup 5 ml contains Sulphamethoxazole 200 mg and trimethoprim 40 mg.

Note: 1. Children <2 months who have fast breathing are always treated as severe pneumonia.

2. Cotrimoxazole should not be given to premature babies and in cases of neonatal jaundice.

groups and refer mothers to them on discharge from the hospital or clinic.

According to NFHS II, the proportion of exclusively breast fed infants at 4 months of age was only 37% and that at 6 months 19%. Delay in initiating breast-feeding is very common. According to NFHS III, only 23% mothers initiate breast-feeding within the desired one hour after birth, and only 37% do so by the end of the first day. As many as 63% women discard colostrum. Initiation of breast-feeding within 1 hour could cut 22% all neonatal mortality. That means in India, if all mothers were enabled to initiate breast-feeding within 1 hour, about 2.5 lakh deaths occurring during first month could be saved. If breast-feeding was universalized it will serve as the single most effective preventive intervention. Exclusive breast-feeding for the first six months can cut down about 15% of all child deaths. However in India only about 20% women are able to practice exclusive breast-feeding for six month which has increased to 41% according to DLHS 3. However, it is still very low in Delhi and Haryana where it is just 12% and 9% (Save the Children India 2013).

Human breast-milk is the best food for an infant. Breast-feeding is the most effective way to provide a baby with complete food and protection and with a caring environment. Babies should be exclusively breast-fed for the first 6 months. It means no drinks like honey, water, gripe water, juices, animal or powdered milks or food other than milk.

Benefits to the baby

1. Feeding colostrum is the 1st Immunization and food for the baby and should not be discarded.

2. Complete food for growth and development of the baby.
3. Readily available in right quantity at the right time.
4. Easily digestible and well absorbed.
5. Hygienic as it is directly coming from breast to the mouth and having very less chances for contamination.
6. Protects against illness as breast milk provide immunity against many diseases in the initial phase of life. In later part of life, lesser incidences of ear infection, orthodontic dental problems, diabetes, hypertension, and cancers are found. Breast feeding reduces 13% to 16% of all under 5 child deaths.
7. Prevents allergies like eczema, asthma, etc.
8. Provide emotional security: breast-feeding establishes closeness between the baby and mother. The contact includes touching, warmth, smell, smile, and appreciating sounds. Breast-feeding improve intelligence (IQ of 8 points more in breast-fed than non-breast-fed babies) and social development of a child.

Breast-fed infants experience nutritional and growth benefits (CDC 1998; Dewey 1998) and develop an enhanced immune system and resistance to diseases (Beaudry et al 1995; Cushing et al 1998; Dewey et al 1995; Duncan et al 1993). The benefits extend into childhood, where breast-feeding decreases the risk of childhood obesity (Armstrong et al 2002; Dietz 2001; von Kries et al 1999) and may lower the risk of several chronic childhood diseases, including asthma and allergy, cancer, diabetes and celiac disease (Khoury et al 2005).

Benefits to the mother

1. Sucking of the nipple produce the release of two hormones—oxytocin and prolactin. Oxytocin contracts the uterus, which helps expulsion of placenta, and control bleeding after delivery. Prolactin not only produces milk but also suppresses the functions of ovaries and delays the return of menstruation and fertility (Lactational Amenorrhea).
2. Helps mother to regain her figure faster.
3. Lowers the risk of breast and ovarian cancers.
4. Decreases mother's workload, by saving time and energy.
5. Alleviates worry for milk spoiling or short supply.
6. Protects against osteoporosis, lowers the risk of breast cancer, and may also lower the risk of ovarian and endometrial cancer.
7. Psychological benefits for the woman include increased self-confidence and facilitated bonding with the newborn.
8. Saving over the cost of feeding formula, less absenteeism from work to care for a sick child (Cohen et al 1995) and less medical expenditures (Ball & Wright 1999).

Health care system support is key for breast feeding promotion, particularly during the prenatal and early postpartum periods when lactation is being established (Khoury et al 2005). Non-supportive hospital practices have also been identified as barriers to breast feeding (Perez Escamilla et al 1994). Recent reviews have also shown that family support is critical for increasing breast feeding (Dennis 2002, Khoury et al 2005). There is a need for health care system interventions, family interventions, and public health education campaigns to promote breast-feeding in low-income women (Khoury et al 2005).

Government of India celebrates world breast feeding week from 1-7 August every year to raise awareness amongst people for benefits of breast feeding.

Early Problems with Breast Feeding

1. Flat or inverted nipple
2. Sore nipple
3. Engorged Breast, Mastitis and Breast Abscess
4. Cracked Nipple

These problems can be solved by simple measures such as keeping hygiene before and after breastfeed, proper positioning of baby while breast feeding, and seeking help in case of problem from medical officer.

COMPLEMENTARY FEED

Adequate complementary feeding between six months to 24 months could prevent an additional 6% of all such deaths. This means that extending coverage of exclusive breastfeeding and complementary feeding could save over 450,000 child deaths each year in India (Planning Commission 2007).

From six months of age, the introduction of complementary food is necessary to meet the nutritional needs of infants as breast milk is not sufficient. Strategies for promotion of exclusive and immediate breastfeeding and the introduction of appropriate

complementary feeding will be important strategies for state RCH II PIPs and logframes, and will be implemented in partnerships with Department of Women and Child Development.

PREVENTION AND CONTROL OF ANEMIA

Nutritional anemia is one of the India's major public health problems. Prevalence is high in all vulnerable groups and in almost all states of the country and has not changed much for last 50 years. Anemia can be diagnosed by clinical signs in field conditions. However, minimum investigation should be instituted. If there is no palmar pallor prophylactic iron and folic acid should be given to the child of 6 month or more. If some palmar pallor present then child should be considered anemic and therapy with iron and folic acid should be given for 14 days and should be assessed in follow-up visit. Mother of the child should be counseled for adequate feeding and hygiene. If the child is diagnosed as severe anemic then s(he) should be referred to a higher center or pediatrician. In 12th Ffive year plan National Iron Plus Initiative has been started (for detail see chapter on nutrition).

PREVENTION AND CONTROL OF VITAMIN- A DEFICIENCY AMONG CHILDREN

Every health worker should be able to diagnose vitamin A deficiency. The sign and symptoms are:

XN	Night blindness
X1A	Xerophthalmia: drying of conjunctiva and cornea
X1B	Bitot's spot: accumulation of foamy, cheesy material on the conjunctiva (Fig. 9)
X2	Corneal Xerosis /Ulceration
X3A	Keratomalacia: melting or wasting of the cornea on 1/3 of the cornea
X3B	Keratomalacia: melting or wasting of the cornea on 2/3 of the cornea
XS	Corneal scar
XF	Xerophthalmic fundus

For Prophylaxis: Vitamin A schedule recommended under the ***National Program for Prophylaxis against Blindness in Children caused due to Vit. A deficiency*** integrated with RCH Program, is 1 lakh IU for 6-11 months old baby as a first dose then from 1-5 years 2 Lakh IU per 6 months. A total of 9 doses

Figure 8.9: Bitot's Spot

of vitamin are given (Govt. of India 2006). Children age 12-35 months who have received a vitamin A dose in last 6 months is 21% only (NFHS-3).

For Treatment: two doses of 2 Lakh IU of vitamin A are given 4 weeks apart according to the program. However, WHO recommended another dose that should be given on second day after the first dose so 3 doses are given. At all level of health delivery the child should be advised to consume vitamin A rich food. If child is less than 2 year then s(he) should be assessed for feeding problem. Nutritional counseling should be given to the mother. Follow up the child after 5 days should be done if feeding problems are existing.

Around 40-50% antenatal mothers attending clinics and OPD showed Vit-A level less then 30 mcg /dl, which is inadequate. Frank Vitamin-A deficiency is easy to identify, however, subclinical cases remain a problem for detection. Urinary ammonia nitrogen > 0.5 is indicative of inadequate status. Such women should be treated with Vitamin A that is not exceeding 10,000 IU per day till symptoms disappear or levels come to normal. Excessive doses are potentially toxic and teratogenic. More emphasis on intake of carotene rich food should be given (NIN 1997).

DEWORMING PROGRAM

Demorming does not anemia prevention significantly, however it has some beneficial effect on health beside anemia. Individual states can have measures to control worm infestation. Therefore central has provided guidelines to give anti-worm drugs according to prevalence rate of worm infestation (Ascariasis, trichuriasis, Hookworm) as specify below:

Appropriate administration of tablets to children between the ages of 1 and 3 years is important. The tablets Tablets should be broken and crushed between two spoons, then safe water added to help administer the drug. It is better to administer with Vitamin A solution to easy delivery (Table 8.9).

Table 8.9: Prevalance of worm infestation and treatment

Category	*Prevalence*	*Action for deworming*	
High	≥ 70%	Pre& school children 2-3 times/year	
Moderate	≥ 50%	Pre & School Children at least once a year	
Low	<50%	Only symptomatic	
Drug	***Doses by age***		
	<1 yr	1-2 yr	> 2 yr
Albendazole	Not given	Half tab	One tab
Mebendazole	Not given	One tab	One tab

UNIVERSAL IMMUNIZATION PROGRAM

Vaccine Preventable Diseases (VPDs) were widespread and were a major cause of childhood morbidity, mortality and life long physical and mental disabilities, prior to the immunization programs. BCG was the first immunization which was started against tuberculosis in 1962 in India that later became the part of EPI (Expanded Program on Immunization), which was started in 1978. In 1979 oral polio vaccine was included in EPI. The program was revised and renamed as Universal Immunization Program (UIP) in 1985 focusing more on infants and pregnant mothers. The measles vaccine was added to this Program in the same year. UIP was later merged with Child Survival and Safe Motherhood Program (CSSM) in 1992 and with RCH in 1997.

Global Alliance For Vaccines and Immunization (GAVI): GAVI is a global network comprising Governments, bilateral agencies, technical agencies, WHO, UNICEF, World Bank, pharmaceutical companies, NGOs like the Bill and Melinda Gates Foundation and the Rockfeller Foundations. It aims at improving access to sustainable immunization services, expanding the use of all existing safe and cost-effective vaccines; accelerating the development and introduction of new vaccines and related products specifically needed by developing countries particularly vaccines against HIV/AIDS, malaria and tuberculosis and making immunization coverage a centerpiece in the design and assessment of international development efforts, including relief (endorsed by 53rd World Health Assembly May 2000). India is a large beneficiary of this initiative.

In an evaluation study DPT3 coverage was analyzed based on the reports on survey-based coverage in 193 countries during 1986–2006. It was found that Crude coverage of DPT3 based on surveys increased from 59% in 1986 to 65% in 1990, 70% in 2000, and 74% in 2006. This indicates that DPT3 immunization coverage has improved more gradually and not to the level suggested by countries' official reports or WHO and UNICEF estimates (Lim et al 2008). Recent trends shows that the pertussis is increasing. Worldwide, the whooping cough affects 30 to 50 million a year and kills roughly 300,000, mostly children in the developing world, according to the federal Centers for Disease Control and Prevention. Therefore constant efforts are required to scal up of vaccination.

UIP under RCH-II: In spite of many years of its functioning the knowledge regarding UIP among people is poor. In some areas such as urban slum the knowledge of measles, and tuberculosis is as low as 26.1% and 15.5% (Misra 2004). Beside increasing awareness about the immunization program is strengthened further in RCH II. India had targeted to achieve zero-polio status in 2005, which was achieved in 2014. Coverage of routine immunization is being enhanced with a focus on underserved communities.

Immunization is one of the most cost effective interventions for disease prevention. The impact of the UIP is measured in terms of vaccine preventable diseases (VPD) burden. Between 1984 and 2003 the infant mortality rate (IMR) in India has fallen from 104 to 60 deaths per 1000 live births. Over the last 15 years there has been a general decline in the reported number of cases of the six main VPD. The output of the UIP is measured in terms of antigen coverage and drop out rates. Antigen coverage rates are a measure of "access" to immunization services. Drop out rates indicate service utilization.

Constraints observed under RCH-I

The most common constraints of universal

immunization program success are:

- Nonuniform Coverage,
- Poor implementation,
- Poor monitoring,
- High dropouts,
- Declining coverage in some major States,
- Over reporting,
- Poor Injection safety
- Reorientation of staff being not carried out.
- Cold chain replacement plan not made.
- Vacancy of Staffs at field level not filled.
- Poor surveillance of vaccine preventable diseases.
- Poor vaccine logistics.
- Poor maintenance of equipment.
- Extraordinary emphasis on polio vaccine.

Under RCH II, the six goals and their respective objectives with strategies to achieve these objectives are summarized below:

Goal 1

Districts will provide efficient and safe immunization services to all infants and pregnant women

Objectives

- Regular quality immunization sessions are planned and held.
- Adequate trained staff are empowered to provide quality immunization services.
- An annually upgraded cold chain inventory according to the levels of the network, allowing for new equipment, substitution, replacement, spare parts, fuel and others will be maintained in order to maintain a functional status of 90%.
- An efficient vaccine and injection equipment management and logistics system to forecast and deliver adequate supplies of vaccines in a timely manner.
- The implementation of safe injection practices and waste disposal.

Strategies

Strategies include coordination between national and state level, printing and supply of national operation guideline, strengthening of supervision; prioritization of poorly performing districts, prioritization of under served populations within districts, proper micro planning in filling up of vacancies, strengthening training for all categories of staff, management of cold chain, procurement and installation of cold chain equipment, proper inventory management, cold chain maintenance and repairs, timely supply of vaccine, ensuring quality control of vaccines, phased introduction of Autodisposal (AD) syringes and safety boxes.

Goal 2

Contribute to global polio eradication, measles mortality reduction and neonatal tetanus elimination.

Objectives

- Polio eradication certification by 2007;
- Elimination of neonatal tetanus by 2009;
- Reduction in measles mortality by 2/3 compared to 2000 estimates, by 2010;
- Achieve and maintain 70% coverage of 2 doses of vitamin A to children <3yrs;

Strategies

Strategies include routine immunization for polio, supplementary immunization campaigns, AFP virological surveillance, strengthening service delivery, increasing reporting and action on cases, data analysis, safe delivery practices, targeting Supplementary Immunization Activities (SIAs), strengthening measles vaccination and surveillance and response to the outbreaks.

Goal 3

The UIP will have sufficient and sustainable funding with established adequate, accountable and efficient fund flows.

Objectives

- Adequate and reliable financial resources at national, state and local levels for the UIP to achieve goals and objectives.
- Political commitment for adequate annual funding at all levels.

Strategies

Strategies include strengthening national financial planning, and building partnerships (strengthening ICC).

Goal 4

Sustain demand and reduce social barriers to access immunization services.

Objectives

- Widespread support by families and communities.
- All eligible children and pregnant women are immunized.
- High level political and administrative support for immunization.

Strategies

Strategies include coverage with print, electronic media, and improve interpersonal communication.

Goal 5

Accelerated introduction of licensed new and under utilized vaccines against diseases with significant mortality and morbidity in India.

Objectives

- Institutional mechanisms in place to adequately obtain, review and utilize information for deciding on introduction of new and under utilized vaccines.
- Review need for MMR or MR vaccine in India's immunization program.
- Review need for introduction of Japanese encephalitis (JE) vaccine.
- A phased introduction of Hepatitis B vaccine.

Strategies

Strategies include improve coordination between MoHFW, research institute, NRI and development partners, disease burden study, Surveillance, and Training.

Goal 6

To monitor and use accurate, complete and timely data on vaccine preventable diseases, AEFIs, antigen coverage and drop out rates by district.

Objectives

- Institutionalized surveillance for VPDs and early detection of any outbreaks.
- Strengthened vaccine quality and injection safety by developing a monitoring system for reporting and responding to adverse events following immunization by 2009.
- An effective, efficient, complete and timely immunization, local recording and area monitoring system by 2009.

Under RMNCH A Plus strategy the focus is on universal coverage by newly introduced pentavalent vaccine, second dose of measles, and introduction of JE vaccine.

MEASLES CONTROL IN INDIA

Measles transmission has been firmly re-established in some European Union (EU) Member States (Muscat et al 2009). Not only this but the EU has become an exporter of measles to the rest of the world, threatening to undermine years of efforts to eliminate endemic transmission of the measles virus. Visitors to Europe are now advised to immunise their infants as early as from six months of age (CDC 2011, PHAC 2011, ECDC 2011) in order to protect them from a disease that can result in complications and lead to severe sequelae such as brain damage and death.

Measles is a highly contagious viral disease occurring in overcrowded areas where poor people live and coverage of measles vaccination is poor. These areas needed special vaccination drive which was initiated by UNICEF in 1998 covering 13 cities and in 1999-2000, 50 more cities were also covered. Now, the main focus is on covering all unprotected children up to the 3 years. In Delhi if the children has not received measles vaccine till 12 months of age MMR vaccine can be given directly. Age for giving MMR is 15 months. MMR can be given till 5 years of age under the UIP (Dt circular 20.3.2006). Analysis of recent outbreak of measles in Greece and Bulgaria (Marinova 2009) indicates that low coverage of vaccination in children and change in national immunization schedule could be the cause of such adverse community events. Study highlights that there is need of constant supervision of national immunization program and repeat dose of MMR in adolescents or youth (Pervanidou et al 2010).

National Technical Advisory Group on Immunization (NTAGI) has recommended:

- States with MCV1 coverage <80%: Second opportunity through measles catch-up campaigns in 9 mo-10 yrs age group
- States with MCV1 coverage ≥80% second dose (MCV2) through routine immunization

Applying the 80% MCV1 coverage cut-off and applying DLHS-3 survey data there are:

- 14 states which qualify for catch-up campaign
- 21 states which qualify for MCV2
- Of these 21 states, 4 states/UTs (Delhi, Goa, Puducherry and Sikkim) are already using second dose of measles in their Routine Immunization programme (as mumps-measles-rubella, MMR).

Strategies

- Target group: 9 m to 10 yrs (irrespective of measles immunization status)

- This age group constitutes ~ 20-25% of total population
- Target population (9 m to 10 years): 134 million
- Regular RI sessions will be conducted without interruption
- Measles catch-up campaign in remaining days
- Immunization will be at fixed posts to ensure safe injection practices
- All sites used for routine immunization sessions
- Additional sites to cover all villages
- Schools with children under 10 years
- Special plans for hard to reach areas and/or underserved populations
- Average Campaign duration: 3 weeks = 12 working days
- 1st week: School based campaign (for 5-10 year children)
- 2nd & 3rd weeks: Community based campaign for remaining children
- Training of all staff followed by development of micro-plan
- Complete measles immunization in one day in a village or an urban area (Mohalla) or in a school
- 1 team = 1-2 vaccinator + 1 ASHA/AWW + 1-2 volunteers (1 vaccinator in NE/ other sparsely populated area)
- One vaccinator will be able to vaccinate in a day
- Approx. 125-150 children in community based booths
- Approx. 200 children in a school booth
- Children will be finger marked with indelible ink
- Catch-up campaign card for each immunized child

In 2010, India introduced the second dose of measles (MCV2) in the country with an aim to complete the catch-up campaigns in early 2013.

Comments: Field based research indicates that seroconversion after second dose in Delhi is not very good. Similarly findings are observed in other parts of country. Level of maternal antibodies have influence over seroconversion. There is need to find out potency of vaccine at end user level, geographic variation of immune response and adverse events following various dosages of measles vaccine in order to have complete idea on benefits of measles vaccination in India. In light of available research introduction of MMR as second dose for Measles should be reconsidered (John J et al 2011).

ELIMINATION OF NEONATAL TETANUS

India accounts for 23% of NNT cases (WHO 2000)
Classification of District (NNT):
High NNT mortality > 1/1000, TT2 coverage <70%, Attented Deliveries <50%
Control: NNT Mortality rate >1/1000, TT2, Coverage >70%, Attended deliveries >50%.
Elimination: NNT mortality rate <0/1000, TT2 coverage >90% and attended deliveries 75%.

Neonatal tetanus is still a common problem in many developing countries. In some instances NNT is responsible for >50% of neonatal deaths which, themselves, may account for >50% of all infants deaths. It is estimated that about 300,000 cases of NNT occurred worldwide each year, of which approximately 2/3rd died. In 2004, in India, a total of 1087 cases were reported. Scientifically this disease can be eliminated by immunizing all women in reproductive age group with tetanus toxoid. The National Program of Elimination of Neonatal Tetanus includes the objectives of:

- Reducing the incidence to less than 1 case per 1000 live birth by 1995 and later it was extended to 2000 and now 2009. It is the component of RCH. Globally 2005 year goal was set.

Interventions include:

1. Coverage of all pregnant women with two doses of tetanus toxoid,
2. Extensive IEC efforts to promote clean deliveries: Five Cleans-Clean Hands, Clean Surface, Clean Blade, Clean Stump, and Clean cord Tie.
3. Providing disposable delivery kits,
4. Community based surveillance of neonatal deaths and investigation and control measures in case of neonatal deaths.

Neonatal tetanus elimination is defined as <1 case of neonatal tetanus per 1,000 live births in every district. Validation of NNT elimination requires the analysis of reported data at district and state levels for the previous three years and identifying highest risk districts within states.

As of May 2013, 19 States and Union Territories in India (Andhra Pradesh, Chandigarh, Goa, Delhi, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Lakshadweep, Maharashtra, Mizoram,

Pondicherry, Punjab, Sikkim, Tamil Nadu, West Bengal, Uttarakhad,) were validated as having eliminated MNT-Maternal and Neonatal Tetanus (WHO 2013). India is declared free of maternal and neonatal tetanus (*BMJ* 2015; 350:h2975) and also certified by WHO (2016).

Recommendations after validation of NNT elimination: a) maintain high TT vaccination coverage to pregnant women, b) improve institutional delivery practices, and c) strengthen surveillance of NNT.

HEPATITIS B VACCINE

Hepatitis B is a viral infection that attacks the liver and can cause both acute and chronic liver disease. The virus is transmitted through contact with the blood or other body fluids of an infected person. It is a major global health problem and the most serious type of viral hepatitis. It can cause chronic liver disease and puts people at high risk of death from cirrhosis of the liver and liver cancer. About 2 billion people worldwide have been infected with the virus and about 350 million live with chronic infection. An estimated 600 000 persons die each year due to the acute or chronic consequences of hepatitis B. These people are at a high risk of death from cirrhosis of the liver and liver cancer. About 25% of adults who become chronically infected during childhood later die from liver cancer or cirrhosis (scarring of the liver) caused by the chronic infection. The hepatitis B virus is 50 to 100 times more infectious than HIV. Hepatitis B virus is an important occupational hazard for health workers. India is in an intermediate endemic state with prevalence of 2-7%. Hepatitis B is preventable with a safe and effective vaccine. A vaccine against hepatitis B has been available since 1982. Hepatitis B vaccine is 95% effective in preventing HBV infection and its chronic consequences, and is the first vaccine against a major human cancer.

Geographical distribution

Hepatitis B is endemic in China and other parts of Asia. Most people in the region become infected with HBV during childhood. In these regions, 8% to 10% of the adult population are chronically infected. Liver cancer caused by HBV is among the first three causes of death from cancer in men, and a major cause of cancer in women. High rates of chronic infections are also found in the Amazon and the southern parts of eastern and central Europe. In the Middle East and Indian subcontinent, an estimated 2% to 5% of the general population is chronically infected. Less than 1% of the population in western Europe and North American is chronically infected.

Vulnerable group

The likelihood that HBV infection will become chronic depends upon the age at which a person becomes infected, with young children who become infected with HBV being the most likely to develop chronic infections. About 90% of infants infected during the first year of life develop chronic infections; 30% to 50% of children infected between one to four years of age develop chronic infections. About 25% of adults who become chronically infected during childhood die from HBV-related liver cancer or cirrhosis. About 90% of healthy adults who are infected with HBV will recover and be completely rid of the virus within six months.

Adults at increased risk of HBV infection are as follows:

- Healthcare workers and public safety workers with reasonably anticipated risk for exposure to blood or blood-contaminated body fluids
- Men who have sex with men
- Sexually active people who are not in long-term, mutually monogamous relationships
- People seeking evaluation or treatment for a sexually transmitted disease
- Current or recent injection drug users
- Inmates of long-term correctional facilities
- People with end-stage kidney disease, including predialysis, hemodialysis, peritoneal dialysis, and home dialysis patients
- Staff and residents of institutions or group homes for the developmentally challenged
- Household members and sex partners of people with chronic HBV infection
- International travelers to regions with high or intermediate rates of HBV infection.

Transmission

Hepatitis B virus is transmitted between people by contact with the blood or other body fluids (i.e. semen and vaginal fluid) of an infected person. Modes of transmission are the same for the human

immunodeficiency virus (HIV), but HBV is 50 to 100 times more infectious Unlike HIV, HBV can survive outside the body for at least 7 days. During that time, the virus can still cause infection if it enters the body of a person who is not infected. Common modes of transmission in developing countries are:

- perinatal (from mother to baby at birth)
- early childhood infections (inapparent infection through close interpersonal contact with infected household contacts)
- unsafe injections practices
- blood transfusions
- sexual contact

In many developed countries (e.g. those in western Europe and North America), patterns of transmission are different than those mentioned above. Today, the majority of infections in these countries are transmitted during young adulthood by sexual activity and injecting drug use. HBV is a major infectious occupational hazard of health workers. HBV is not spread by contaminated food or water, and cannot spread casually in the workplace.

The virus incubation period is 90 days on average, but can vary from about 30 to 180 days. HBV may be detected 30 to 60 days after infection and persist for widely variable periods of time.

Symptoms

Hepatitis B virus can cause an acute illness with symptoms that last several weeks, including yellowing of the skin and eyes (jaundice), dark urine, extreme fatigue, nausea, vomiting and abdominal pain. People can take several months to a year to recover from the symptoms. HBV can also cause a chronic liver infection that can later develop into cirrhosis of the liver or liver cancer.

Treatment

There is no specific treatment for acute hepatitis B. Care is aimed at maintaining comfort and adequate nutritional balance, including replacement of fluids that are lost from vomiting and diarrhoea. Chronic hepatitis B can be treated with drugs, including interferon and antiviral agents, which can help some patients. Treatment can cost thousands of dollars per year and is not available to most patients in developing countries.

Liver cancer is almost always fatal, and often develops in people at an age when they are most productive and have family responsibilities. In developing countries, most people with liver cancer die within months of diagnosis. In higher income countries, surgery and chemotherapy can prolong life for up to a few years in some patients. Patients with cirrhosis are sometimes given liver transplants, with varying success.

Prevention

Hepatitis B Vaccination

Hepatitis B is preventable with safe and effective vaccines. More than 160 countries have already added this vaccine to their routine immunization programs. Introduction of Hepatitis B vaccine has been recommended by many experts and the Committee on Immunization (1999). A pilot project for assessing the feasibility of Hepatitis-B vaccine in the Universal Immunization Program has been launched in 33 districts and slums of 15 metropolitan cities. First dose may be given at birth or within 48 hours of delivery in Institutional deliveries. Otherwise three doses are given together with OPV and DPT doses in the dose of 0.5 ml (10 mcg) intramuscularly. Vaccine and syringes are being made available by Global Alliance for Vaccine and Immunization. The overall coverage of Hepatitis B vaccine to the target population in these districts is about 76% for 3rd dose.

Government of India has expanded the Hepatitis –B vaccination during 2007-08, under the UIP in all the districts of the 10 good performing States of A.P, Karnataka, Kerala, Madhya Pradesh Maharashtra, Punjab, Tamil Nadu, J&K Himachal Pradesh and West Bengal. All infants should receive the hepatitis B vaccine: this is the mainstay of hepatitis B prevention. The vaccine can be given as either three or four separate doses, which is a part of existing routine immunization schedules. In areas where mother-to-infant spread of HBV is common, the first dose of vaccine should be given as soon as possible after birth (i.e. within 24 hours).

Though the schedule of hepatitis B is same to that of DPT, its coverage is less than DPT coverage is due to poor stock management of newly introduced vaccine, incomplete recording and reporting, fear of wastage of costly vaccine in a 10 dose vial leading to limited use, incomplete knowledge amongst health workers

about vaccination schedule (Lahariya 2013). Also Hepatitis B vaccine birth dose was less implemented in these states.

The complete vaccine series induces protective antibody levels in more than 95% of infants, children and young adults. After age 40, protection following the primary vaccination series drops below 90%. At 60 years old, protective antibody levels are achieved in only 65 to 75% of those vaccinated. Protection lasts at least 20 years and can be lifelong also. All children and adolescents younger than 18 years old and not previously vaccinated should receive the vaccine. People in high-risk groups should also be vaccinated, including:

- persons with high-risk sexual behavior;
- partners and household contacts of HBV infected persons;
- injecting drug users;
- persons who frequently require blood or blood products;
- recipients of solid organ transplantation;
- those at occupational risk of HBV infection, including health care workers; and
- international travellers to countries with high rates of HBV.

The vaccine has an outstanding record of safety and effectiveness. Since 1982, over one billion doses of hepatitis B vaccine have been used worldwide. In many countries where 8% to 15% of children used to become chronically infected with HBV, vaccination has reduced the rate of chronic infection to less than 1% among immunized children.

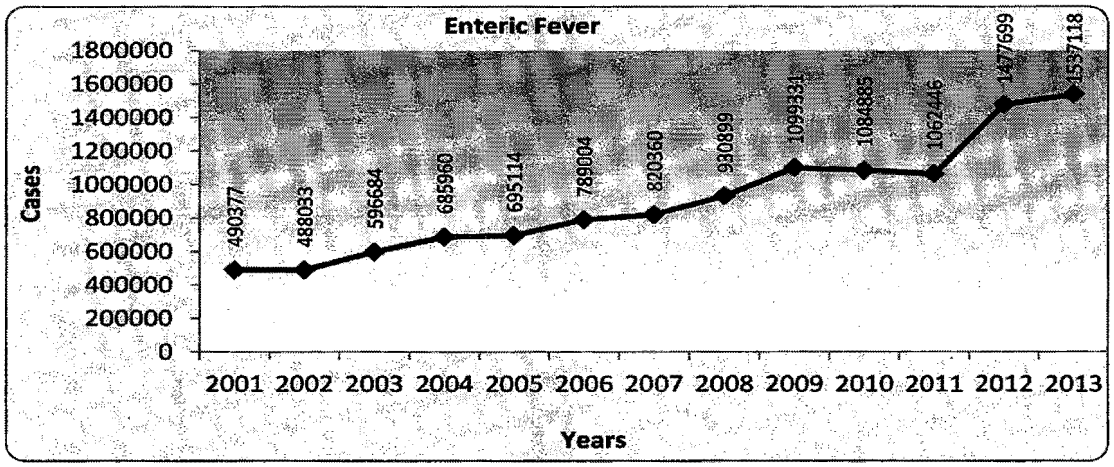
As of December 2006, 164 countries including India vaccinated infants against hepatitis B during national immunization programs - a major increase compared with 31 countries in 1992, the year that the World Health Assembly passed a resolution to recommend global vaccination against hepatitis B (WHO 2008).

Hepatitis B vaccine should be given to infants (12 months of age and younger) in the thigh muscle. Either the thigh or the upper arm muscle may be used for young children. The upper arm muscle is the preferred site of administration for adolescents and adults. Hepatitis B vaccine should always be given into the muscle despite the age of the patient. Hepatitis B vaccine, usually a three-dose series, is recommended for all children 0-18 years of age. It is recommended for infants at birth borne in the hospital. The schedule is given in table. All older children who did not get all the recommended doses of hepatitis B vaccine as an infant should complete their vaccine series as soon as possible.

TYPHOID VACCINE

Typhoid is a major public health problem worldwide caused by Salmonellae typhii. It is causing 3 billion infection per year and 21.7 million illnesses and 217,000 deaths worldwide. S paratyphi A and B are also causing 5.4 million infections. Both the pathogens are common in inants, children and adolescents. In India also it causes heavy morbidity and mortality. Number of cases are continuously increasing over the last decade (Fig. 8.10) Due to development of resistance against chloramphenical, ampicillin and trimethoprin, Ciprofloxacin became the first line drug. But reports

Fig 8.10. Number of cases of enteric fever since 2001 to 2013



are available where typhoid is resistant to ciprofloxacin, cephalosporin, azithromycin also. The biggest challenge is development of Beta lectamase in typhoidal salmonellae (Harish & Menezes 2011). Due to presence of poor hygiene and sanitary conditions prevention is foremost important by vaccine. Typhoid vaccine has been introduced in Delhi by the Directorate to safeguard all children below 5 years of age. Vaccine can be given to children above 2 years of age till 5 years of age intramuscularly.

ROTAVIRUS VACCINE

Rotavirus is one of the most common causes of diarrhea in children under 5 years of age, more so in children less than 2 years of age. It can lead to malnutrition, reduced immunity, and even death. The rotavirus vaccine protects children from rotavirus diarrhea and also reduces the frequency and severity of diarrhea. Rotavius vaccine is introduced in UIP on 26th March 2016 where government stated that 3 doses of 5 drops each to be given to the child at 6, 10 and 14 weeks along with Pentavalent and polio vaccine. In phase I, the vaccine will be given in Haryana, Himachal Pradesh, Andhra Pradesh and Odisha and later on will be expanded to whole nation.

Hib VACCINE

Haemophilus influenzae is a Gram-negative coccobacillus that affects only humans. There are six types of Haemophilus influenzae (a, b, c, d, e, and f), but Haemophilus influenzae type b (Hib) bacteria accounts for over 90% of serious Haemophilus influenzae infections in children. Hib bacteria live as commensals in the upper respiratory tract. Like measles, Hib is passed from an infected person to an uninfected person via droplets of saliva/respiratory secretions, when an infected individual coughs or sneezes. Hib can also be spread when children share toys and other objects that they have put in their mouth. The probability of transmission increases when children spend prolonged periods of time together in settings such as day-care or crèches. Children are often asymptomatic carriers of the Hib bacteria showing no signs or symptoms but still can infect others.

Approximately 410,000 (19%) of under-5 deaths in India are due to pneumonia out of which an estimated 70,000 are caused by the Hib (Hib in India 2009). Data from some developing countries such as Bangladesh, Chile and Malawi suggest Hib as a cause of over 20% of life-threatening childhood Pneumonia (Hib in India 2009). Small scale studies from India have documented case-fatality rate for Hib meningitis as 11%, and about 30% of survivors suffer from major disabilities (Hib in India 2009). There is a paucity of nationwide data on the exact epidemiological burden of Hib disease in India, and figures provided by the agencies are based on broad estimates. This is one of the most contentious issues for Hib vaccine introduction in the Universal Immunization Program (UIP) of India. Some experts have questioned the data on Hib disease provided by the agencies, and concluded that the overall disease burden does not warrant universal immunization of children. However, there is now an emerging consensus among experts that the Hib disease does pose a significant health burden in India. Also the issue of high cost, low utility and death following pentavalent vaccine raised by some researchers and ex-policy makers in a public interest law suit before honorable Delhi High Court led the Government to convene NTAGI meeting and seek its view. On recommendation of NTAGI, the pentavalent vaccination programme started in two states namely Kerala & Tamil Nadu, instead of earlier planned 10 states, from 3rd week of Dec 2011. However in its 1st month of operationalization, 4 children died due to adverse events following pentavalent vaccination.

PENTAVALENT VACCINE

The pentavalent vaccine combines five different vaccines in one injection to protect against five diseases:

- Hemophilus influenzae type B (Hib) disease
- Diphtheria
- Pertussis
- Tetanus and
- Hepatitis-B

Children immunized with the 5-in-1 vaccine do not need to be vaccinated separately with the DPT vaccine (except booster dosages) or the Hepatitis B vaccine (except birth dose) as he/she will get those in the same injection. All children during their first year of age should receive three doses of pentavalent vaccine with an interval of at least four weeks between the doses. However children who have already started

immunization with DPT and Hepatitis-B have to complete their vaccination with DPT and Hepatitis-B only. They are not to be given pentavalent vaccine. Vaccination with pentavalent must be completed within two years of age if the child starts before 1 year of age. Children under six weeks of age, over five years, teenagers and adults should not be given pentavalent vaccine because of the DPT component.

Vaccine schedule

Age	Vaccines given
Birth	OPV-0 BCG
6 weeks	OPV-1 Penta-1
10 weeks	OPV-2 Penta-2
14 weeks	OPV-3 Penta-3
9 months	OPV-4 Measles

If a child misses the date for vaccination, the child can be given the dose as soon as possible. There is no need to restart the vaccination schedule.

Comments

The greatest concern is regarding the long-term sustainability of the program. Who will bear the brunt of the expenditure incurred on introducing the vaccine all over the country? The cost of vaccine is many times higher than isolated doses of vaccines. Will adequate stocks be available to meet the huge need, ensuring uninterrupted vaccine supply? A recent evaluation in 5 states implementing hepatitis B vaccination program has indicated that poor stock management, fear of wastage of costly vaccine, lack of knowledge are responsible for poor hep B coverage than DPT. In this context, is it feasible to train and win the morale of health workers to adopt a new & costly vaccine and revised UIP schedule? If coverage becomes lower than earlier DPT coverage in a given state, it is going to affect efficiency & credibility of health care system as well as disease dynamics. Moreover it does not replace hepatitis birth dose as well as booster dosages of DPT and thus space in cold chain still remains a challenge. The partial introduction of pentavalent vaccine in UIP adds more pressure to our inadequate cold chain system at all level. There are reports of side effects from other developing countries and also in India. If side effects continue to occur in India that could have adverse impact on credibility of immunization program as whole as this is still sustained. Though the current grant is only for two years for 10 selected states, GAVI alliance is hoping that the prices of this combination vaccine will fall drastically in next few years once increased demand spurs the competition between vaccine developers (Vashishtha 2009).

COLD CHAIN SYSTEM

Cold Chain is a system of protection against high temperatures for heat labile vaccine, sera, and other active biological preparations. Unless the cold chain is preserved, such preparations are inactivated and immunization procedures, etc., will be ineffective. Preservation of the cold chain is an integral part of the Universal Immunization Program of the country. The cold chain is a system of transporting and storing vaccines at recommended temperatures from the manufacturers to the point of use. The cold chain is essential as vaccine loose their potency if exposed to temperature above 8° Celsius and to sunlight. For vaccines like DPT, TT, and DT the recommended temperature is 2° to 8° Celsius and on freezing they lose their potency. Vaccines have a limited shelf life and must be used within their expiry date. The principal of First-in, First-out (FIFO) should be followed to avoid expiry. In this the vaccine which has been received first in store should be consumed first. The vaccine received after the first stock should be consumed when the first stock is finished.

The cold chain equipment:

1. *Walk in coolers (WICs) and Walk in Freezers (WIF)*: They are used to store vaccines for 3 months and they serve a region of 4-5 districts usually located at state /regional level. They are big rooms where man can go inside and take the vaccine. Temperature of these big room coolers are kept at 2° to 8° Celsius. Walk in Freezer maintains its temperature at minus 20° Celsius.
2. *Deep freezers* (300 liters) and Ice Lined Refrigerators (ILRs) with 300/240 liters capacity are available at the District and CHC level where 1 month supply of vaccine can be stored. OPV and measles are stored at this level. Ice packs are also prepared here.
3. *Small deep freezers and ILRs* of 140 liters capacity: One small deep freezer has been provided to the PHC, Urban family Welfare

Centers and Postpartum centers. Here also one-month supply can be stored.

4. *Cold Boxes:* they are used either for storing vaccines for one week or more or when vaccines need to be transferred.
5. *Vaccines carriers:* These boxes are having 4 ice packs that can maintain temperature for longer than one day. However, the vaccines should be used on the same day.
6. *Day carriers:* On the day of vaccination these boxes are used. In them 2-4 ice packs are kept to keep the temperature at lower level.

The basic cold chain system is supported by- a) refrigerated vans and vaccine delivery vans for transporting vaccines from medical stores depots to regional stores and from regional to district level stores; b) Cold boxes transport vaccines from district to CHC/ PHC; and c) Vaccine and day carriers to transport vaccines from PHC to field units, subcenters and for outreach sessions.

According to National Cold Chain Assessment (2008), India has a total of 66,765 operational refrigeration units (ILRs and deep freezers) and 199 walk in cold rooms and freezer rooms with around 45% of these equipments were being CFC equipments (UNICEF 2008). The assessment further suggests that there was a need of 160 WIC, 49 WIF, 25,196 ILR and 29,678 DF of different capacities to address the cold chain pace shortage for UIP. Also there is acute shortage of trained manpower to manage these cold chain equipments with a single training institute located in Pune. Additionally, real time web-based MIS (Management Information System) to track and monitor vaccine and logistics movement, and to forecaste supply is recommended at least up to divisional vaccine stores.

Quality of Cold Chain: National Quality Control Laboratories at Kasauli does the quality control and only after its testing, vaccines are released. In addition to this, samples of OPV are picked up from various levels of storage and sent to the designated laboratories keeping the required temperature for potency testing to ensure effectiveness of cold chain system (***Reverse cold chain***). For routine as well as PPI campaigns, all vials of oral polio vaccines have been provided with ***Vaccine Vial Monitor*** that would indicate if vaccine is exposed to higher temperature.

Points to be noted during immunization are:

1. Vaccines are not stored at the subcenter level and must be supplied on the day of use.
2. PHC must not hold more than one month's stock.
3. Immunization must be carried out in the shade, and the vaccines (OPV and Measles) must be kept on an ice pack or in a cup of ice during the vaccination session. No direct sun light should fall on them.
4. OPV samples should be sent with fully frozen ice packs and rushed to the assigned laboratory for the potency test.
5. Measles vaccine should be used within 4 hours of reconstitution. Similarly BCG also should not be used after 3 hours of reconstitution.

Implementation of program

Introduction of AD syringe: In the immunization program glass syringes were used after sterilization for injection. The INCLEN study revealed that 17% of the injections were due to immunization and 2/3 of the those injections were unsafe. In order to address to injection safety and increase efficiency in the program the Ministry of Health and Family Welfare introduced Auto Disable (AD) syringe in the immunization program in the last quarter of 2005. The AD syringe is now been universally available for use in the immunization program across the country.

The Multi year plan is the basis for strengthened routine immunization. Under this plan the States have made their State specific project implementation plan (PIP) i.e. PIP part-C of NRHM. The PIPs covers area for strengthening the Service delivery component of Routine immunization. These are:

1. Alternate vaccine delivery: The last storage point of vaccine is of PHC. For this purpose every PHC and above has been provided with twin set of Ice Line Refrigerator (ILR) and Deep Freezer (DF). Every district has been provided with one vaccine van. The vaccine is being transported from the State HQ to PHC with the help of these vaccines van. However, there was no support for transportation of vaccine from PHC to village session site, as a result ANM used to collect and transport vaccine to session site thereby consuming lot of valuable time which otherwise could have been

use for conducting immunization session. In order to bring in efficiency and fidelity to the program, support has been provided to deliver the vaccine in the village and other outreach session site as per microplan. The flexibility has been provided to use the available local means of transport. However, there has to be appropriate maintenance of record for transparency.

2. *Alternate Vaccinators:* It was observed that most of the plan sessions are not held as the vaccinator is not available. In order to ensure that every session as per microplan is held, a provision has been made for alternate vaccinators who are not part of the system by providing honorarium @ Rs 350 per session conducted. Such session will be conducted either at Urban Slum, Unserved or under-served areas. In order to operationalise the alternate vaccinator, each district should have list of such vaccinators prepared well in advance so that these worker could be pressed for conducting sessions at the short notice.

3. *Social Mobilization:* Social mobilization of beneficiaries by the ASHA (Accredited Social Health Activist) / Link Worker / Anganwadi worker (AWW) / local RI mobilizer etc. is one of the important activities to improve coverage. The social mobiliser should be assigned specific task for mobilizing: (i) all children who dropped out the last session. For this purpose ANM will prepare list of defaulter using Tickler boxes/ bags/other methods and hand over one copy to the mobiliser. (ii) preparing a list of all newborn delivered in between two sessions and mobilizing them for vaccination. (iii) informing all other beneficiaries about the next date of vaccination and mobilize them. For this purpose ASHA or link worker is provided Rs. 150 per session in ASHA State and Rs. 100 in non ASHA state.

4. *Strengthening Supportive supervision:* Each district has been provided a sum of Rs. 50,000 for mobility support to carry out supportive supervision. In bigger State a sum of Rs. 1,00,000 has been provided at the State level for the mobility support of the State officials for supportive supervision. Each such visit should be followed by a written report of the visit and feedback to all other sessions on the observations.

5. *Half yearly meeting at state with districts:* Support has been provided for organizing half yearly meeting with district officials at the State. A central government representative must be invited in such meeting.

6. *Support for Petrol/Diesel etc:* In order to run power generators some states have been provided support of payment for kerosene or diesel.

7. *Printing:* Printing of Immunization card, Immunization register, temperature chart, tickler box etc. must be carried out by the State. There will be no further supply from the center. However, to maintain universality of these immunization cards, immunization register, state will stick the design and format of the center.

8. *Downsizing BCG vaccine vial:* The BCG vaccine vial has been down sized from 20 doses to 10 doses to ensure that the vaccine is available in every session site.

9. *Computer assistant:* for e-reporting and e-monitoring

Surveillance of Vaccine Preventable Diseases

Although reporting of VPDs is a component of the Community Need Assessment (CNA) reporting format, the Department of Family Welfare has to resort to the data made available by Central Bureau of Health Information (CBHI) since the CNA reporting is neither regular nor complete. In order to further strengthen the VPD surveillance certain new initiatives have been taken. Measles Surveillance has been integrated with the existing AFP surveillance in three states of Tamil Nadu, Karnataka and Andhra Pradesh and there are plans to expansion to other States.

Factors for the success of Immunization Program

There is a significant reduction of incidence rates of vaccine preventable diseases in India due to implementation of Universal Immunization Program. There are following factors which have contributed in success of the program:

- Good disease surveillance
- No pathogen variations
- Potent Vaccine
- Adequate development and/or procurement of vaccines.
- Appropriate and acceptable choice of technologies.
- Universal vaccination (even among childhood vaccines).
- Adequate logistics, cost-benefit analyses, and resource mobilization.

Interventions to improve vaccination outcomes are commonly grouped into those targeting health services delivery or supply (e.g. improving human resources training, logistics, cold chain maintenance and vaccine storage, effective financing, monitoring and evaluation and supportive supervision) and those that stimulate demand for vaccines (e.g. monetary or food incentives, knowledge transfer or communication campaigns). Certain demand-side interventions have been associated with improved vaccine coverage of children in low- and middle-income countries in systematic reviews (Johri M et al 2015).

Factors for the failure of Immunization Program

Recently coverage levels in most of the districts have been declining or not improving for last many years particularly for DPT (NFHS-3), which is a serious matter. Cases of Diphtheria have been reported from Rajkot and Delhi (Patel et al 2004; CBHI 2001; Singhal et al 2000; Lodha et al 2000). Following reasons have been enumerated for poor performance:

- The emphasis of government has been shifted from UIP to Pulse Polio program since 1995. Same reason has been given for reduced pace of IMR decline from 3.3% to 1.8% per year after 1995 onward.
- Immunization sessions are not being held regularly in the community.
- Inadequate mobility of the health workers and the supervisory staff at district and state level.
- Problem of delivery of vaccines and drugs to outreach sessions's sites.
- In urban areas lack of adequate health infrastructure and multiplicity of agencies working without proper coordination.
- Lack of trained manpower for vaccination.
- Impact of rumors of vaccine adverse events or deaths: AEFI or rumors about attribution of adverse events to vaccines are known to create huge setbacks in vaccination. After receiving the news of deaths due to immunization, measles immunization was stopped. Similar events in the past (fears about oral polio vaccine safely) derailed the polio eradication drive in India, Africa and other regions. Pertussis safety concerns in 1970s led to decline in vaccine coverage from 80% to 30% in England and Wales in 1980s (Nature reviews immunology :1: 160; 185 (1 nov 2001)

Many new initiatives are being undertaken by the government to strengthen routine immunization. Introduction of AD syringes for all immunization led to replacement of the existing glass syringes and needles. The BCG vial has been downsized from 20 doses to 10 doses in order to ensure that BCG vaccine is available in all immunization sessions. In children below one month of age 0.05 ml I/D can be given. In above one month of age 0.1 ml I/D BCG can be given. With each vial one 1 ml ampoule of normal saline is also given to make 10 doses.

NATIONAL IMMUNIZATION SCHEDULE

Under the routine immunization schedule vaccines against TB, polio, tetanus, diphtheria, pertussis and measles are given in Table 8.10.

Table 8.10 : National Immunization Schedule

Age	Vaccines
Birth$	BCG, OPV, Hep B*
6 Weeks	DPT, OPV, Hep B*, Rota$
10 Weeks	DPT, OPV, Hep B*, Rota$
14 Weeks	DPT, OPV, Hep B*, Rota$
9 Months	Measles
15-18 Months	MMR*
16-24 Months	DPT (1 Booster), OPV
24 months	Typhoid*
4-5 years	DPT# (2 Booster), OPV*
10 & 16 years	TT
Pregnant (Un-immunized)	2 doses of TT with 1 month interval
Pregnant (Immunized)	One booster dose of TT
NIDs and SNIDs	As per govt. directives

For institutional delivery and oral and hepatitis B is considered zero doses, * Delhi Govt. Schedule. Hepatitis is given in some states only. # Initially DT used to be given but recently DPT is advocated by the Government. Rotavirus vaccine 3 doses of 5 drops each along Pentavalent and polio vaccine. In 4 states: Haryana, Himachal Pradesh, Andhra Pradesh and Odisha in Phase I.

Other available vaccines recommended by Indian Academic of Pediatrics (IAP) for children who can affords the cost are given below:

6 weeks	HiB	H Influenzae B
10 weeks	HiB	H Influenzae B
14 weeks	HiB	H Influenzae B

12 months	Varicella	Chicken pox
	Influenza	Influenza vaccine
18 months	HiB	H Influenzae B
24 months	Hepatitis A	HA Vaccine-I
	Meningococcal	Meningococcal Vac
30 months	Hepatitis A	HA Vaccine-I
5 year	Typhoid	Typhoid vaccine
	Meningococcal	Meningococcal Vac

MISSION INDRADHANUSH

Full immunization against preventable childhood diseases is the right of every child. With a view to provide this right to every child, the Government of India launched the Universal Immunization Program (UIP) in 1985, one of the largest health programs of its kind in the world.

Despite being operational for over 30 years, UIP has been able to fully immunize only 65% children in the first year of their life and the increase in coverage has stagnated in the past 5 years to an average of 1% every year.

To strengthen and invigorate the program and achieve full immunization coverage for all children at a rapid pace, the Government of India launched Mission Indradhanush in December 2014.

Mission Indradhanush will ensure that all children under the age of two years and pregnant women are fully immunized with all available vaccines.

The ultimate goal of Mission Indradhanush is to ensure full immunization with all available vaccines for children up to two years and pregnant women.

The Mission is strategically designed to achieving high quality routine immunization coverage while contributing to strengthening health systems that can be sustained over years to come. In the last few years, India's full immunization coverage has increased only by 1% per year. The Mission has been launched to accelerate the process of immunization and achieve full immunization coverage for all children in the country. The Government has identified 201 high focus districts across 28 states in the country that have the highest number of partially immunized and unimmunized children.

Mission Indradhanush will target these districts through intensive efforts and special immunization drives to improve the routine immunization coverage in the country.

The first round of Mission Indradhanush was flagged off on 7th April 2015 across all 28 States and Union Territories garnering an enthusiastic response.

It was made possible by the concerted efforts of union and state governments and various development partners such as WHO, UNICEF, UNDP, Rotary, Care among others. Various NGOs working at regional or state levels also supported the program in their capacity, locally. The Control Room for monitoring Mission Indradhanush was set up at Immunization Technical Support Unit (ITSU) of Ministry of Health and Family Welfare (MoHFW).

In April around 2.1 lakh sessions were conducted where nearly 21 lakh children and 5.4 lakh pregnant women were vaccinated and more than 52 lakh antigens were administered.

In these 4 rounds, more than 190 lakh antigens were administered to more than 97.9 lakh beneficiaries of which 76.8 lakh were children and 21.1 lakh were pregnant women.

In addition, 20.5 lakh doses of Vitamin A were given to children and 17.1 lakh packets of ORS and 57.3 lakh Zinc tablets were also distributed to children since commencement of Phase I of Mission Indradhanush on 7th April 2015.

POLIO ERADICATION PROGRAM

Pulse Polio Program and National Polio Surveillance Project

Introduction: The World Health Assembly passed a resolution in May 1988 to eradicate the dreaded polio from the face of the Earth by the end of year 2000. The American region was declared polio free in 1994 followed by Western Pacific in 2000 and Europe in June 2002. Globally as on 24th August 2011 there were 333 cases of polio; in which 111 are from endemic countries and 222 are due to importation or restablishment of polio. In 2010 there were a total of

1349 cases. In India there is no case reported since 13th Jan 2011 when one case (WPV1) from West Bengal was reported. In April 2014 the India is declared free from polio.

History of Eradication strategy

With the intention to complement the routine immunization achievements, in 1995 India took a giant step closer to eradicating polio, through the strategy of National Immunization Days-Pulse Polio Immunization. Polio can be caused by three types of wild polio viruses-Type I, Type II, & Type III. Type I poliovirus is predominantly isolated in children with paralysis. It is estimated that for every child with paralytic polio, at least 100 other children are affected who have either no symptoms or have only nonspecific symptoms of a mild illness. Oral polio vaccine (Trivalent) is considered to be effective in preventing polio.

Most recently monovalent vaccine has been recommended in those areas where type 1 virus is active because of following reasons:

1) epidemiological experts recommend refined mOPV1 (made from attenuated type 1 virus) to be used in geographic areas where wild Polio virus type 1 WPV circulation is on;
2) mOPV1 provides an increased immunity to type 1 virus compared to tOPV for the same number of doses and even for the first dose in neonate;
3) children immunized with mOPV1, if exposed to WPV1, will excrete less virus and for a short period of time, limiting the possibility of further transmission;
4) In India in 2005, 94% of polio cases were caused by type 1 and type 3 cause 4 cases.

Under the Child Survival & Safe Motherhood Program, the Polio Eradication Program had following objectives:

a) reach and sustain coverage level more than 85%;
b) identify "at risk" pockets;
c) conduct "Mop-up" rounds in low transmission period; and
d) strengthen surveillance.

Actions

1. Ensure timely and complete reporting of cases of acute flaccid paralytic paralysis,
2. Improve clinical diagnosis to differentiate polio from non-polio cases,
3. 60 days follow up of suspected polio cases to confirm diagnosis, and
4. Virus isolation to confirm diagnosis.

Later it was suggested to organize the National Immunization Days for example "Pulse Polio" to increase immunization levels in areas with low coverage. This would be beneficial for the eradication of polio. Delhi adopted the strategy and later on the whole country accepted two doses of polio immunization one month apart for all under five children.

The term '***pulse***' has been used to describe this sudden, simultaneous, mass administration of OPV on a single day to all children 0-5 years of age irrespective of their previous polio vaccination status. Pulse polio immunization replaces the wild virus with vaccine virus and thereby eradicates the harmful "wild" virus in the community. The effect is maximized during the low transmission season of polio that is from December to January. Even a single case is treated as an outbreak and preventive measures are initiated, usually within 48 hours of notification of the case. Containment measures are not recommended if the period after onset of paralysis is more than 14 days.

Four basic strategies to eradicate polio:

1. Routine Immunization: Immunize every child aged < 1 year with at least 4 doses of oral polio vaccine (Trivalent vaccine) through Universal Immunization Program. When coverage level with 3 doses was less than 80%, special campaigns should be conducted

2. National Immunization Days (NIDs)/ Pulse Polio Immunization (PPI) program/Sub-National Immunization Days (SNIDs): Conducted by giving additional doses of OPV, 4-6 weeks apart to every child aged <5 years. Intensification of the Pulse Polio Immunization program has been done by adding additional rounds at fixed booths followed by house-to-house "search and vaccinate" component. Intensification of PPI needs a meticulous planning of the program along with intensive supervision and monitoring besides social mobilization effort.

National Immunization Days: In India, transmission of polio has dramatically reduced from 1934 laboratory

confirmed cases in 1998 to 1126 in 1999, 263 in 2000, 1600 in 2002, 225 in 2003 and 134 in 2004 and 66 cases in 2005 and 676 cases in 2006 but cases were increased to 874 in 2007, reduced to 559 in 2008 but again increased to 721 in 2009. It has been decided that there is a need to make extra efforts to reach the un-reached during Pulse Polio Immunization Days. For that reason ***Intensified Pulse Polio Immunization*** was proposed and just after the National Immunization Day (*"Polio Ravivar"* i.e. Polio Sunday), a immunization team would visit house to house with vaccine to check whether the child has received pulse polio vaccine and if not, then child must be given a dose at that time only. An elaborative work plan has been proposed for each supervision and monitoring to ensure that no child is left without polio vaccine. Since Jan 2011 there is only one case.

3. Surveillance of Acute Flaccid Paralysis (AFP): To identify all reservoirs of wild poliovirus transmission surveillance of AFP has been started. AFP is now defined as "any child aged less than 15 years of age who has sudden onset of flaccid paralysis or paralytic illness in a person of any age when polio is suspected."

The conditions which needs to be reported under the perview of AFP Surveillance are:

1. Guillain Barre Syndrome
2. Acute Transverse Myelitis
3. LMN Type Bells Palsy
4. Post Ictal Paralysis or Todd's Palsy
5. Flaccid Hemiplegia, Paraplegia, Tetraplegia irrespective of cause
6. Post Diptheritic Polyneuritis
7. Foot Drop

Objective: To find places with circulation of wild poliovirus.

Components

a) Establishment and Maintenance of Reporting Units (RUs)

Reporting units form the backbone of surveillance network. These are hospitals, pediatricians, doctors, and medical/health establishments in government or private sectors who are likely to see a case of Acute Flaccid Paralysis (AFP). The reporting units are well distributed to cover all areas in the country. Apart from reporting AFP cases immediately, the RUs send a Weekly AFP surveillance report to the District Immunization Officer (DIO) irrespective of whether or not they see a case of AFP during the week. Each RU has a nodal officer responsible for reporting and upkeep of records. At present, 8,453 RUs are participating in AFP surveillance throughout India. Apart from these, numerous small clinics, private practitioners, doctors of Indian systems of medicine, quacks (all together termed as informers) report AFP cases whenever they see them. Both the Surveillance Medical Officer (SMO) and DIO are involved in the creation of a sound reporting network, visit regularly to the reporting units in their area and conduct active case searches in the RUs at regular intervals to look for any cases that might not have been reported.

b) AFP Case notification

The RUs and informers notify AFP cases immediately to the DIO. Since very important activities like stool specimen collection, outbreak response immunization, active case search in the community, etc. should occur early, rapid notification is very essential.

c) AFP case investigation

An AFP case is immediately investigated, usually within 48 hours of notification, by DIO or SMO. After confirming the case as AFP, the DIO clinically examines the child, takes history and fills a standard Case Investigation Form (CIF).

d) Stool specimen collection and transportation

From every case of AFP, 2-stool specimens are collected. The aim is to get these specimens at the earliest, within 14 days of onset of paralysis (or maximum of 8 weeks) and at least 24 hours apart. Each specimen is 8 grams or about adult thumb size collected in a clean, dry screw capped container. The container need not be sterile and no preservative/transport media is used. The specimens are collected, labeled and transported in cold chain to the designated national lab. A standard laboratory request form (LRF) is filled that accompanies the stool specimen. Special stool specimen carriers have been provided to districts for this purpose.

e) Outbreak response immunization (ORI)

Following stool specimen collection, outbreak response immunization is organized in the community. All 0-59 months old children are given one dose of oral polio vaccine irrespective of their previous immunization status while going house to

house. The recipients include all target children in the village/locality. At least 500 children are vaccinated. The ORI is performed as soon as possible. The travel history of the child may suggest additional places of stay where ORI should also be conducted. While conducting the house-to-house immunization during ORI, active case search is also conducted in the community.

f) *Active case search in the community*
In the community where an AFP case lives, a house-to-house active case search is organized to find more AFP cases if they have occurred. This activity is carried out immediately along with Outbreak Response Immunization (ORI). The case definition used during searches is: *flaccid/ floppy paralysis in a child between 0-15 years of age with onset within last 60 days.* All the cases that are found, are investigated immediately and 2-stool specimens are taken before the child is given oral polio vaccine (OPV). The purpose of the search is to fully uncover additional polio cases, if any, in the community.

g) *60-days followup examination*
The District Immunization Officer or Surveillance Medical Officer revisits every case of AFP 60 days after the onset of paralysis to confirm the presence or absence of residual weakness. Child is assessed for weakness, asymmetrical skin folds, and difference in left/right mid-arm/mid-thigh circumference. The child is said to have residual weakness if any of the above sign is present, even if minimal. This activity is completed before 70th day of onset of paralysis.

h) *Cross notification and tracking of cases*
The cases are investigated anywhere in India irrespective of where the child lives. A very advanced communication system (telephone/fax/ e-mail) has been established that sends information to DIO of the resident district about the AFP case immediately. The AFP case is constantly tracked by SMOs to complete all the activities related with surveillance. This also leads to realistic and complete epidemiological picture at district level.

i) *Data management and analysis*
At the end of each week, DIO reports to the State EPI Officer the line lists of all new AFP cases. He summarizes the activities and reports the current status of investigation and the follow-up of AFP cases. Reporting takes place even when no cases of AFP have been identified. The data is entered into computers at National Polio Surveillance Unit and is used for program monitoring, checking quality of data and assessing progress towards eradication. The data is analyzed for taking appropriate action.

j) *Case classification*
When lab results and 60-days follow-up examination reports are available, the cases are classified at NPSU as polio or non-polio. Until 1999, the clinical system of classification was being used. According to this scheme, a case is classified as polio if wild polio virus is isolated from the stool samples collected. If 2 adequate stool specimens have been collected from the case within 14 days of onset of paralysis and the stool results are negative then the case is non-polio. If the case had inadequate stool specimen and the AFP case had residual weakness, died or lost to follow-up then that case is classified as polio. From January 2000, India has shifted to the advanced virological system of classification. Cases with inadequate stool specimen and having residual weakness, died or lost to follow-up are subjected to special investigation and are presented for the review by the Expert Group at national level. The Expert Group classifies the case as Compatible or Discarded. This has been possible due to the achievement of a high level of surveillance of AFP.

k) *Feedback*
In order to give timely feedback, the reports and maps, which are generated by NPSU, are on the web site. NPSU also sends line lists of the cases to the States twice a month.

4. Conduct extensive house-to-house immunization mopping-up campaigns in the final stages in focal areas where wild poliovirus transmission persists.

Mopping Up: Conduct extensive house-to-house immunization mopping-up campaigns: Experience from previous years has shown that though the National Immunization Days (NIDs called as Pulse Polio Immunization or PPI in India) decrease polio transmission and delay the annual peak in high endemic states, the virus persists and bounces back in the later half of the year. But to achieve eradication quickly, it will be critical to target the remaining districts with extra rounds of house-to-house immunization with or

without fixed booth activity before the onset of the hot summer and the subsequent high season of polio during the rains.

Mopping up is not a Sub-National Immunization Day (SNID). SNIDs are done when there is widespread and dispersed transmission in a part of the country and are aimed at reducing the transmission to clearly delimited, focal areas. SNIDs are not an end-game strategy and can be repeated a few times if needed. On the other hand, mopping-up is aimed at stopping transmission in a defined area. This can't be repeated too many times. In mopping-up the virus from an area or population, there are no shortcuts to reaching all children. Going house-to-house or family-to-family are tools to achieve that elusive goal of reaching all eligible children.

Responsive Mopping up is conducted when surveillance shows evidence of polio virus transmission in an area. Pre-emptive mopping up or high risk response immunization is carried in district which have high intensity of polio transmission which is sustained through low transmission session.

1. Mops should target both the area of detection of wild polio virus iin a case or in the environment, and area of origin of the virus if these are a clear genetic link.
2. In context of India, mop ups should target a minimum of 2-5 million children, in a multi-district activity, across states where it is necessary. The actual extend of mop ups should be decided by the mop ups operation groups on the basis of epidemiological, virological, gerographical and other factors.
3. The first mop up round should be conducted within 2 weeks oif WPV confirmation. subsequent rounds should be short interval, i.e., spaced a minimum of 2 weeks and a maximum of 4 weeks apart, in order to rapidly raise population immunity.
4. In non high risk areas: mop ups should consist a minimum of 3 high quality rounds using short interval approach.
5. In high risk areas: SNIDS rounds may constitute one or more of the 3 rounds, but in principle at least one additional round should be carried out in an appropriate area using a short interval approach.

Operationalization

Macroplanning: it is carried out by the core team at state level involving Secretary health, director, MCH officer, coordinators etc. They finalize the following:

1. Action plan;
2. Making budgetary arrangement;
3. Solving manpower related requirement;
4. Meeting logistical requirement, their procurement and then their distribution;
5. Transport;
6. Planning for training and orientation of the workforce;
7. Social mobilization;
8. Creation of useful and practical IEC material;
9. Interaction with Assembly and Zonal Coordinators;
9. Conducting various inter-sectoral and intra-sectoral meetings; and
10. Supervising and monitoring quality and coverage of services.

Micro Planning is known as aggregative planning. It is principally aimed at determining the overall growth rate of the real national income of the economy. It is also usually aimed at stabilizing the general price level of the economy and maximizing the growth rate of employment of labor. *Microplanning* is done by assembly coordinators/zonal coordinators involving medical officers and their staff. Following activities are carried out:

1. Field visits, identifying new pulse polio booth, site mapping, and team movement in house to house activity; identification of high risk areas-wild virus or compatible areas, JJ clusters/unauthorized or resettlement colonies, areas with poor routine immunization, minority community areas, previously faced problems areas or in microplanning, and solving them.
2. Meeting health functionaries of each and every health outlet for their cooperation and support.
3. Identifying the cold chain points for H-T-H work.
4. Interaction with the regional vaccine store for ensuring vaccine supply and other logistics.
5. Meeting the local influential persons for their support to mobilize the community.
6. Generation of local awareness about the 'Polio Ravivar' and house to house activity.
7. Training and orientation of the workers.
8. Sourcing of the health and other paramedics from various sectors like education, health, NGOs, ICDS.

9. Making arrangement for immunization of children in transit; 1 booth for every 250 children in general and it could vary depending on density of population and terrain.
10. Interaction with the state level core team coordinators for day to day problems. Solving and appraisal on the activities accomplished.

Last initiatives

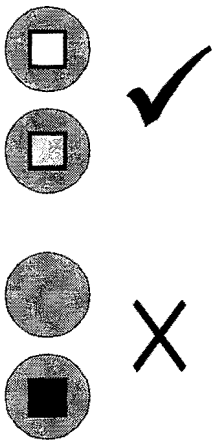
- Supplementary Immunization Activities (SIA): High risk area approach, underserved strategies and covering transit sites (including railways) are important activities to reduce polio cases.
- Strategy of immunization with mOPV1 in all SIA in all areas of known type 1 transmission and at highest risk
- tOPV use for all routine immunization activities and SIAs in polio-free states.

Quality of booth activities and Microplanning for quality of immunization services are ensured through supervision, monitoring and management.

Future Polio Eradication Strategy

Polio vaccination would continue as routine immunization and methods to introduce IPV would be explored. Strick vigilence of the polio affected countries would continue.

Vaccine Vial Monitor



During the Intensified Pulse Polio Program Immunization there is a need to reach every eligible child with potent Oral Polio Vaccine. The Vaccine Vial Monitor (VVM) is a simple tool, which enables the vaccinator to know whether vaccine is potent at the time of administration. On the Vaccine Vial there is a circle mark in which a small square is printed which is either white or lighter than the color of circle that indicate that the vaccine is potent and can be used. However, if the color of square is dark or of same color as circle mark then the vaccine should be discarded. However, in one study it was found that VVM is unreliable tool indicating cold chain in higher temperture (Shrivastava et al 2012).

Achievements

In 1988 the total polio cases were more than 350,000 in 125 countries. In 2005, it is reduced to 1940 cases in 5 countries (endemic) and in 11 countries (importation); 1606 in 2009 from 14 countries. Globally there are 333 cases and just one case since Jan 2011 in India and declared free in 2014 (Table 8.11).

Table 8.11: Strains of Polio isolated among AFP cases India

Year	P1		P2		P3	
	Wild	Vac	Wild	Vac	Wild	Vac
1998	1735	59	83	84	190	86
1999	397	208	11	142	730	159
2000	138	168	0	75	56	126
2001	209	113	0	70	56	126
2002	1484	102	0	112	113	168
2003	202	123	0	70	22	179
2004	127	278	0	116	7	245
2005	59	739	0	130	4	409
2006	648	899	0	148	28	270
2007	-	-	-	-	794	-
2008	75	-	-		484	-
2009	80	2	-	15	662	-
2010	18	0	-	2	24	-
2011	1	-	-	0	0	-
2012	0	0	0	0	0	0
2013	0	0	0	0	0	0
2014	0	0	0	0	0	0
2015	0	0	0	0	0	0

Certification of Polio Eradication

It is conducted on regional basis. Each region can consider certification only when all countries in the area demonstrated the absence of wild polio virus transmission for at least three consecutive years in the presence of certification standard surveillance (AFP and environmental Surveillance).

In addition, all facilities holding wild polio virus infections and potentially infectious material must have implemented biocontainment measures according to Global Action Plan for Laboratory Containment of Wild Polio Virus (2009). If no polio virus detected in WHO SEA region till February 2014, it will be eligible for

Polio Eradication. India remained free from polio and finally WHO declared "Polio Free India". However even if WHO SEA get certified for Polio Eradication, the risk of polio infection will still remain as two endemic countries Pakistan and Afghanistan are located nearby that could pose a risk for continued polio circulation in India and other WHO SEA countries.

Polio Eradication and Endgame Strategic Plan 2013–2018:

This is a comprehensive, long-term strategy for a polio-free world by 2018, developed by the Global Polio Eradication Initiative (GPEI) in consultation with national health authorities and other stakeholders, as per directive of the World Health Assembly. This plan envisages the eradication of all polio disease, whether caused by WPV or cVDPV and has four objectives.

1. Detect and interrupt all poliovirus transmission
2. Strengthen immunization systems and withdraw oral polio vaccine
3. Contain poliovirus and certify interruption of transmission
4. Plan polio's legacy

Polio endemic countries

Afganistan Nigeria Pakistan

Countries with re-established Transmission

1. Angola 2. Chad
3. Democratic republic of Congo
4. Sudan

Countries with imported polio virus

1. Congo 2. Kazekhistan
3. Liberia 4. Mali
5. Mauritenia 6. Tajikistan
7. Turkmenistan 8. Nepal
9. Niger 10. Russian Federation
11. Senegal 12. Sierra Leone
13. Ugenda

POLIO SWITCH OVER

Between 17 April and 1 May, approximately 150 countries will switch from the trivalent oral poliovirus vaccine (tOPV) to bivalent oral poliovirus vaccine (bOPV). This represents the largest withdrawal of one vaccine, and associated roll out of another vaccine in history. The extensive use of trivalent OPV around the world has been largely responsible for reducing the number of cases of wild poliovirus from over 350,000 in 1988 to just 74 in 2015. In the same period, the number of countries endemic to polio has decreased from 125 to just 2. Now only Afghanistan and Pakistan remain endemic to wild poliovirus.

Polio is caused by three very closely related viruses, types 1, 2 and 3. In September 2015, the Global Commission for the Certification of Eradication of Poliomyelitis confirmed the eradication of wild poliovirus type 2, the last case of which was recorded in India in 1999, and has not been detected in humans or in the environment since.

The trivalent oral polio vaccine contains live, attenuated (weakened) virus of all three serotypes, and is administered orally. The virus is able to replicate in the gut, during which time the individual is able to mount an immune response.

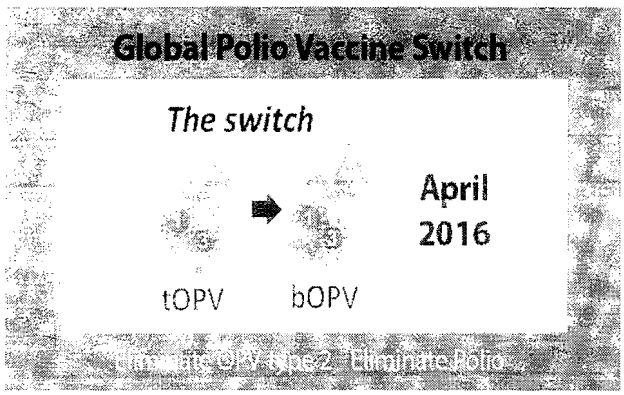
In exceptionally rare circumstances, if too few people in a community are vaccinated, the vaccine-virus may begin to circulate, and if continued uninterrupted over many months, the vaccine-virus may reacquire neurovirulence, and cause cases of paralysis. This is known as a circulating vaccine-derived poliovirus (cVDPV). However, if enough people are vaccinated during immunization the vaccine-virus will die out before it is able to revert to a neurovirulent form. As such, cVDPVs are not a problem of the vaccine – they only occur in communities in which coverage is low.

The risks of cVDPVs are well known and accepted. In the last 10 years, vaccination against poliovirus has averted more than 5 million cases of paralysis. In the same period, only 725 individuals have been paralysed by a cVDPV.

While the wild poliovirus type 2 has been eradicated, it is the type 2 component in tOPV – now essentially redundant – which has been responsible for more than 90% of the cVDPV cases in the last ten years. However, while tOPV is still in use, there is the continued risk of reintroduction of cVDPVs. As such, polio can only be eradicated if all OPV is eventually withdrawn. The withdrawal of the type 2 component

in April 2016 is the first stage of this withdrawal (Figure8.11).

Figure 8.11. Polio Switch over



Use of trivalent OPV after the switch could jeopardize polio eradication by generating type 2 cVDPVs. The switch must be globally synchronised to ensure that no country is put at risk of importing a type 2 cVDPV from another country that continues to use tOPV. With the globally synchronised cessation, the type 2 vaccine-virus in the environment should die out before a new birth cohort introduces new susceptible individuals for the virus to persist within.

A stockpile of monovalent oral polio vaccine type 2 (mOPV2) which only contains attenuated type 2 virus will be mobilised in the event of any cVDPV type 2 outbreak, that started circulating prior to OPV2 cessation. In the future, the inactivated poliovirus vaccine (IPV), which does not pose any risk of generating cVDPVs, will be used in place of OPV. If progress is maintained, poliovirus can be the second-ever human disease in history to have been eradicated. This will represent a remarkable achievement and will protect all future generations from the devastating effects of poliovirus.

POLIO ERADICATION: Critical Review

Strengths

1. In 1988, World Health Assembly adopted the goal of polio eradication and set the target date of 2000 for the same. Pulse Polio Immunization can eliminate the polio infection from the community as observed in the America and many other countries. The 69th World Health Assembly in Geneva Global Leaders have reaffirmed committment to end polio over and for all.
2. The global eradication of poliomyelitis is also highly cost beneficial. Cost on rehabilitation of polio victims as well as the purchase and delivery of polio vaccine will no longer be necessary.
3. World might not get another chance to make a choice to eradicate polio because global investment in the immunization program has produced enough immune people at this point of time to make elimination of wild poliovirus possible.
4. The extensive use of trivalent OPV around the world has been largely responsible for reducing the number of cases of wild poliovirus from over 350,000 in 1988 to just 74 in 2015.

Weaknesses

However, recent knowledge and events about polio have disapproved that polio can be eradicated due to following reasons:

1. There are many serotypes of wild polio virus which can cause poliomyelitis but this was not the case of small pox.
   Orphan Virus: It is >1.5% different genetically, from its nearest relative showing that this lineage might have circulated over a long period of time without being picked up through AFP or environmental surveillance.
2. Occurrence of cVDPV (circulating vaccine derived poliovirus) outbreaks: It is believed that Sabin (vaccine) polio virus is not only nonpathogenic but also does not have the ability to circulate. However, some mutant strains have now been reported which have not only acquired abilities to cause paralysis but also to circulate via the oro-fecal route. These strains have been labeled as cVDPV. Several small outbreaks with cVPD have been described with occurrence of paralytic cases.
3. Persistence of vaccine virus in immuno-compromised individuals: Some mutant strains of vaccine virus have been reported which are being continuously excreted by immuno-compromised individuals over as long as 7 years period. There are around 9 varieties of immunodeficiency in the world. Although no paralytic case is reported to have occurred due to these strains, there is concern that they may have the potential to mutate back to the wild state and cause paralysis in the index case as well as others.
4. Environmental persistence of wild polio: It was

believed that wild polio virus survives only for a very short period of time in the environment. However, recent environmental surveillance has revealed that wild poliovirus may survive in the environment even after these areas have not had any clinical case of polio for several months. This has been noted in India also from one site where sewage samples were analyzed. Yoshida et al (2000) reported vaccine-associated type 3 polioviruses in sewage and river water, indicating the environmental pollution by oral vaccination program. The risk of infection from environmentally polluted water in many other countries along with India with densely populated communities that have poor hygiene and sanitation, is also high. Wild Polio Type 2 has been detected from the drain in Hyderabad in June 2016 followed by air lifting 2 lakh polio vaccine from Geneva (TOI 16th June 2016). Similarly flaccid case of polio was reported after few days from UP. In case of infection from the environment, the vaccine virus could have the similar potential for transmission as that of wild virus. It is well known that high mutation rate is present in picornaviruses (103 to 104).

5. It is interesting that the present polio eradication program, does not seek to control its spread through the feco-oral route. Better water supply and sewage management would have helped reduce polio occurrences and deaths due to diarrhea, hepatitis A and E, enteric fever and other gastrointestinal infections (Phadke In.Gangolli 2005).
6. Persistence of wild polio virus in the guts of immunized individuals: Even immunized individuals can participate in continuing the orofecal circulation of wild virus. The vaccine virus can recombine with other enteroviruses causing AFP that cannot be differentiated from polio (Arita 2005).
7. ***"Sink Source" dynamics:*** has been demonstrated in Uttar Pradesh and Bihar by its persistence in few high risk districts despite intense and repeated SIA rounds. The infection keeps expanding during high transmission season and spreads to other areas as well. But there has been no long term transmission of WPV in other parts of India (Arora & Basu 2010).
8. Many believes in the feasibility of polio control rather than polio eradication (Arita 2006, Roberts 2006). Developed countries of the world have therefore, decided to continue routine immunization with IPV indefinitely even after achievement of global zero polio status to prevent cases of cVDPV or possible bioterrorism (Mittal 2007). Another group from Harvard School of Public Health is of the opinion that intensity of immunization must be increased to achieve eradication and even a small decrease in intensity could lead to large outbreak (Thompson et al Lancet 2007).
9. Risk of vaccine associated paralytic (VAP) polio is 1 in 1.5 to 2.2 million doses in America (Andus et al 1995). Some say that this risk is less in India in-spite of multiple mop-ups and NIDs (Kohler et al 2002). However, this risk will remain threatening to the eradication program (Mittal 2005).
10. As no wild polio case was reported in India since 13 January, 2011; India's name was dropped from the list of polio endemic countries by WHO in 25 February, 2012. However neighboring countries like Pakistan and Afghanistan still remains polio endemic that could threat India's polio free status in future.
11. Martinez-Bakker et al (2015) studied the trend before the invention of polio vaccination, they concluded that (1) polio persistence was the product of a dynamic mosaic of source and sink populations; (2) geographic heterogeneity of seasonal transmission conditions account for the latitudinal structure of polio epidemics; (3) contrary to the prevailing "disease of development" hypothesis, they demonstrated that polio's historical expansion was straightforwardly explained by demographic trends rather than improvements in sanitation and hygiene; and (4) the absence of clinical disease is not a reliable indicator of polio transmission, because widespread polio transmission was likely in the multiyear absence of clinical disease. As the world edges closer to global polio eradication and continues the strategic withdrawal of the Oral Polio Vaccine (OPV), the regular identification of, and rapid response to, these silent chains of transmission is of the utmost importance.

For achieving the global goal of eradication of poliomyelitis some new strategies include: the use of IPV in conjunction with OPV to interrupt poliovirus

transmission in high-risk areas; stopping OPV worldwide when IPV coverage makes it safe to do so; and continuing IPV with routine childhood immunizations. Continued global vigilance, surveillance, and vaccine response capacity will be needed to respond to the risks of variable immunization coverage and susceptible subpopulations in some countries. Basic and field research will be crucial to better understand poliovirus genetics and biology, population movement, investigate the role of antiviral drugs, and improve vaccines as part of an ever evolving strategy to eliminate poliomyelitis as a threat to all future generations (Ehrenfeld 2008).

REPRODUCTIVE HEALTH

Strategic framework: Short Term

- Achieve a Contraceptive Prevalence Rate (CPR) of 53%.
- Reach an All India mean TFR of 2.7.
- Reach a mean TFR of 3.5 in EAG states.
- Promote an expanded basket of contraceptive choice.
- Contraceptive and method specific promotion through acceptor couples including sensitive to cultural and caste needs. Attempt to double the coverage and reach through the social marketing program.
- Promotion of contraceptives through rural health practitioners.
- Focused and integrated BCC addressing the requirements of newly married couples and older couples.
- BCC focusing on increased age at marriage, increased age at first birth.
- Expanded MTP facilities available.
- Increasing male involvement for responsible parenthood and in playing an active role in adoption of limiting methods.
- Service provision and access made easy through networking.
- Public-private partnerships encouraged to provide the services.
- Increase exposure to mass media for mobilization and reinforcement.

Strategic framework: Medium Term

- Achieve a Contraceptive Prevalence Rate (CPR) of 65%.
- Achieve an All India mean TFR of 2.2.
- Achieve a mean TFR of 2.8 in EAG states.
- Make the program invisibly branded and promote achievements.
- Promote the concept of quality of life with higher disposable incomes of smaller families and hence enhanced quality of life.
- Focused BCC and intensive efforts in the EAG states to facilitate and accelerate the reduction in TFR through impacting drivers such as empowerment of women, education of women and reduction in IMR.
- Enhance the basket of contraceptive offer.
- Franchising and increasing the network of providers through networking and intensifying partnerships.
- District based monitoring intensified.

Strategic Framework: Long term

- Achieve a stable level of population.

Current Choice of Contraception

There are still 222 million women who have an unmet need for modern contraception, meaning they do not want to become pregnant for two years or more but are not using a modern contraceptive method. That is, they do not want more children or they want to postpone their next pregnancy by at least two years yet, they are not using contraceptives. For example, in 19 countries a median of 15% of unintended pregnancies resulted from contraceptive failure (Population Reports 2006). This indicates that a suitable and safe contraceptive is required everywhere. There are other several reasons for this unmet need, including:

- Fear of side effects—perceived and real.
- Limited knowledge about methods.
- Weak health systems that impede access to contraceptive methods.
- Laws that require a husband's consent to seek family planning services.
- Reliance on breastfeeding to prevent another pregnancy.
- Opposition to family planning by a partner or family members.
- Infrequent sexual intercourse.

Contraceptive uses over the last 15 years have increased at a very slow rate. The total unmet need

for family planning according to NFHS-III is 13.2% which is reduced from 15.8% of NFHS-II. In India, on a nation wide basis the family planning program currently offers five modern contraceptive options. (Table 8.12).

Table 8.12: Trends of Contraceptive Use (Proportion)

Indicators	NFHS		NFHS	
	I	II	DLHS	III
	1993	1999	2004	2006
Any Methods	40.6	48.2	53.0	56.3
Any Modern Method	36.3	42.8	45.7	48.5
Pills	1.2	2.1	3.5	3.1
IUD	1.9	1.6	1.9	1.7
Condom	2.4	3.1	4.8	5.3
Female Sterilization	27.3	34.2	34.3	37.3
Male Sterilization	3.4	1.9	0.9	1.0
Any Traditional Method	4.3	5.0	7.3	-
Periodic Abstinence	2.6	3.0	4.1	-
Withdrawal	1.4	2.0	2.7	-
Other	0.2	0.4	0.5	-
Not using any Method	59.4	51.8	47.0	43.7

DLHS: District Level Household Survey, NFHS: National Family Health Survey

Priority interventions under RMNCH A Plus

1. Community-based promotion and delivery of contraceptives
2. Promotion of spacing methods (interval IUCD)
3. Sterilisation services (vasectomies and tubectomies)
4. Comprehensive abortion care (includes MTP Act)
5. Prevention and management of sexually transmitted and reproductive infections (STI/RTI)

1. Community based doorstep distribution of contraceptives

ASHA charges a nominal amount from beneficiaries for her effort to deliver contraceptives at the doorstep, that is, INR 1 for a pack of 3 condoms, INR 1 for a cycle of OCPs and INR 2 for a pack of emergency contraceptive pills (ECP).

Oral contraceptive pills

There are two types of oral contraceptive pill: combined oral contraceptive (COC), "the Pill", and the progestogen-only pills (POPs) also known as the "mini pill". At present only the combined pill is available under the program. When used correctly, COCs have a pregnancy rate of 1-8% in the first year of use. Whilst there may be some side effects such as nausea, breast tenderness, breakthrough bleeding and headache. COCs offer a range of therapeutic advantages such as the regulation of menstrual cycles, decreased menstrual flow, some protection against ovarian and endometrial cancer and benign breast diseases and prevention of ectopic pregnancies. *Limitations* with use of COCs include strict user compliance and the fact that effectiveness may be lowered when certain concurrent medication is taken. Serious side effects (thrombosis) though rare, are possible. In India 3% of married women are using combined OC (NFHS-3) which was 2% in (NFHS-2) indicating that there is not much improvement in oral pills acceptance as a contraceptive.

Condoms

Condoms are the most popular barrier contraceptive in India. They have the advantage of being the only contraceptive method that provides dual protection from pregnancy as well as from STI/HIV. When used correctly every time, the failure rate is 3% in the first year of use. The NFHS-3 showed that only 5.3% of couple use condom as a method of contraception which was 3% in NFHS-2.

Estimated pregnancy rates during perfect use of condoms, that is for those who report using the method exactly as it should be used (correctly) and at every act of intercourse (consistently), is 3 percent at 12 months. The most frequently cited condom effectiveness rate is for typical use, which includes perfect and imperfect use (i.e. not used at every act of intercourse, or used incorrectly). The pregnancy rate during typical use can be much higher (10-14%) than for perfect use, but this is primarily due to inconsistent and incorrect use, not to due condom failure. Condom failure – the device breaking or slipping off completely during intercourse – is uncommon.

In Thailand, the promotion by the government of 100% condom use by commercial sex workers led to a dramatic increase in the use of condoms (from 14% in 1990 to 94% in 1994); an equally dramatic decline was seen in the nationwide numbers of bacterial STD cases (from 410,406 cases in 1997 to 27,362 cases in

1994); and reduced HIV prevalence in Thai soldiers. The other studies show that, with consistent condom use, the HIV infection rate among uninfected partners would be less than 1% per year. Also, in situations where one partner is definitely infected, inconsistent condom use can be as risky as not using condoms at all (Hanenberg 1994).

The social marketing of condom had begun with the launch of 'Nirodh' condoms by the government in 1968 when 400 million condoms were imported. In 2004, Corporate Voice Weber Shandwick (CVWS), in association with USAID, ICICI Bank and MoHFW launched a campaign mainly focused on married couples as its slogan '*Ek Duje Ke Liye*', encouraging husbands to care for the sexual health of their wives and also with the message that condom should be used within marital relationships. In 2006, to remove the feeling of embarrassment while buying a condom, the "*Condom, Bindaas Bol*" (condom- Just Say It) campaign was launched. BBC World Service Trust (BBC WST) launched a campaign "real man" in March 200811. Further, they launched the "condom- condom" ringtone. The 'KamaSutra' brand condom was launched by J K Ansell Ltd (JKAL), Aurangabad in 1991 for sexual pleasure. The potential factor contributing to the condom's popularity may be active social marketing programmes and commercial advertising of condoms. The most significant barriers like lack of privacy in stores and social stigma were associated with condom use. The reasons for not using condom include not accepted by sexual partner, perceived ineffectiveness, less comfort, lack of sexual satisfaction with condoms, husband's alcohol use, depression, anxiety, and not available at that instant (Donta et al 2014).

Female Condoms

These are safe, pre-lubricated barrier contraceptives. When worn, it lines the vagina gently. It should be used only once and then discarded. It offers protection against both pregnancy and STI/HIV. In relation to HIV prevention, a molecular condom is also being developed which turns into a gel-like coating when inserted into the vagina. When it is exposed to semen, it returns to liquid form and releases an antiviral drug to attach to HIV antigen.

Wearing a condom requires considerable motivation from the woman. It is still not widely accepted even in Western world because of its cost and suitability. However, Indian government has accepted it to launch in the market with the name of "Confidom" being manufactured by an Indian company. Cost reduction is an important agenda of the government to make it available widely.

Latex allergies are very rare among the general population. The Centres for Disease Control, Atlanta, USA estimate that the population risk of an allergic reaction to latex is 0.08% and the nature of the reaction tends to be very mild (McNeill et al.1998).

Use of condom

Condoms are the only contraceptive method proven to reduce the risk of all sexually transmitted infections (STIs), including HIV. They can be used as a dual-purpose method, both for prevention of pregnancy and protection against STIs (Table 8.13).

Table 8.13: Protective Efficacy of Condom in different STIs

Pathogen	Estimated efficacy %
Human immuno deficiency virus	>90 protection
Hepatitis B virus	>90 protection
HPV	Not significant
Herpes simplex virus type 2	10-50 protection
Cytomegalovirus	50-90 protection
Chlamydia trachomatis	50-90 protection
Neisseria gonorrhoeae	>90 protection
Trichomonas vaginalis	>90 protection??*
Treponema pallidum	50-90 protection
Haemophilus ducreyi	10-50 protection
Pthirus pubis	Not significant

*Latest data: Condoms provide no reduction in the transmission of the HPV or *Trichomonas vaginalis*. HPV=Human papilloma virus; STIs=Sexually transmitted infections

2. Promotion of spacing methods (interval IUCD)

Introduction of a new IUCD of five years duration; post-delivery IUCD insertion; counsellors in District Hospitals and high case load facilities and training of health personnel in IUCD insertion at all levels of health facilities are the key measures taken for promotion of spacing methods. Availability of IUCD 380 A (that provides protection for over 10 years) and 'fixed day services' at all facilities are to be ensured.

Intrauterine Devices (IUDs)

The first year pregnancy rate for the Copper T 200B (effective life 3 yrs) is 0.5 – 3% and the equivalent rate for the Copper T 380 (effective life 10 yrs) is 0.6 – 0.8% (Figure 8.10). The advanced version of IUDs, e.g. Cu T 380 A is being procured and supplied to the states. They are suitable for breast feeding women, not user dependent, inexpensive and do not interfere with intercourse. IUD use does, however, require a trained provider for counselling and insertion. Recent studies indicate that IUDs do not have increased risk of PID in users who have no history of RTI/STIs. Similarly it is not contraindicated in HIV patient. Increased menstrual flow and cramping are common, usually settling in the first few months. NFHS-3 estimates that 1.8% of currently married women use IUDs which was 1.6% in NFHS-2. Cu T-380A is effective for 10 years and may be extended up to 12 year. Good counseling increases client satisfaction.

Women who can not use IUD:

- women who have had PID in the past, so long as they have no known current risk factors for STIs;
- women with STIs other than current purulent cervicitis, gonorrhea and chlamydia;
- women with vaginitis, including trichomonas vaginalis and bacterial vaginosis;

Women who can use IUD:

- women at high risk of HIV infection;
- women who are infected with HIV but do not have AIDS;
- women with AIDS who are doing clinically well on ART;

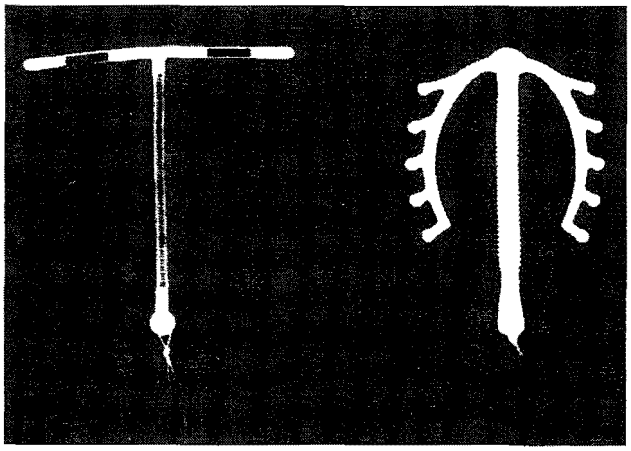


Figure 8.10: Copper T

- women who develop PID or any STI while using an IUD and who are undergoing treatment can continue using an IUD;
- women who live in areas where STIs are common but who are not themselves at very high individual risk of exposure to gonorrhea or chlamydia.

Emergency contraception (EC)

Emergency contraceptives may be used by a victim of sexual assault or who have had unprotected sex, or condom breaks during sex. It is known by several other names *e.g.* 'morning after' or post-coital method. Knowledge on emergency contraceptive particularly about the methods, dosage, and time and its advocacy is inadequate among providers as well as potential users (Singh AB 2005; Tripathy 2003; Singh 2002,). There are two types of Emergency Contraceptives suggested by the program: *the progestin-only pill* and the *IUD*. The progestin only pill (75mg) can prevent pregnancy within 72 hours of unprotected intercourse. Efficacy of the EC is given in table 8.14). Other Emergency Contraceptives are as follows:

i. High dose estrogen in a dose of 5 mg daily for 5 days;
ii. Estrogen-progestogen combination: (a) Yuzpe method: EE 50 μg + LNG 0.25 mg of 2 pills given as soon as possible after unprotected coitus and 2 pills repeated after 12 hours; (b) EE 30 μg + LNG 0.15 mg of 4 pills are taken as soon as possible after unprotected coitus and 4 more pills after 12 hours; (c) EE 200 μg + dl-norgestrol 2 mg or 1 mg/LNG 1 mg of one pill as the first dose followed by another pill after 12 hours.

Table 8.14: Efficacy of different ECs regimens

EC regimen	Pregnancy Rate %	Prevented Fraction %
Yuzpe regimen	3.2	75
Levonorgestrel	1.1	85
Mifepristone	0.9	85-90
CuTIUD	0.1	99-100

iii. Anti-progestogen-Mifepriston (RU-486) in 600 mg single dose within 72 hours of unprotected sex;

iv. E-pill (Levonorgestrel 0.75mg): is hormonal contraceptive that can be used to prevent pregnancy following 'an' unprotected act of sexual intercourse within the past 72 hours. It is a very critical option for preventing an unwanted pregnancy or unsafe abortion in case of sexual assault or failure of contraceptive devise. The Drug Controller of India has approved only Levonorgestrel (LNG) (progestogen-only) for use as ECP. LNG is available in 0.75 mg. tablets. LNG is the 'dedicated product' for emergency contraception as it will be specially packaged at the correct dosage for use as ECP.
Mechanism of Action: The exact mode of action of ECPs is not known, but probable mechanisms include a) Inhibition or delay of ovulation, b) Thickening of cervical mucus, c) Direct inhibition of fertilization, d) Histological and biochemical alteration in endometrium leading to impaired endometrial receptivity to implantation of fertilized egg, e) Alteration in transport of egg, sperm and embryo, and f) Interference with corpus luteum function and luteolysis. ECPs (LNG) are not effective once the process of implantation has taken place. They will not cause an abortion

Effectiveness: When used correctly (time and dose as prescribed) after 'a single' act of unprotected sexual intercourse, the ECPs fail to prevent pregnancy in about 2% of women (the chances of pregnancy after a single act of unprotected sexual intercourse is 7-8%). In multiple acts of sexual intercourse, the risk of pregnancy is higher unless it is ensured that the ECPs are taken within 72 hours of the first act of sexual intercourse. Since ECPs are used only once, it can not be directly compared to the failure rates of regular oral contraceptives based on use during a full year. If vomiting occurs within 2 hours of starting the dose of ECPs can be repeated with full dose.

Regular use of ECPs is not recommended due to the following reasons:

- Overall ECPs are less effective than regular contraceptives.
- With frequent use of ECPs, the failure rate, the side effects and costs would be more than that of regular hormonal contraceptives

Advantages: Effective if taken correctly as prescribed, Safe for all women including those who have conditions, that are listed as precautions in case of other hormonal contraceptives, does not affect lactation, use not associated with foetal malformation or congenital defects

Disadvantages: Has to be used within 72 hours of the first act of sexual intercourse as use of the ECP beyond this period increases the risk of pregnancy, effectiveness decreases with frequent use, does not protect STIs/ HIV, and side effects; nausea, vomiting, irregular bleeding per vagina, breast tenderness, headache, dizziness, fatigue

Using the Pills: Emergency Contraceptive Pills are taken in two doses. Take the first dose as soon as possible after unprotected intercourse and the second dose 12 hours later. Or, alternatively, both pills can be taken together. This option does not change the effectiveness, but may be more convenient.

Side Effects of ECs

Side effects of ECs include nausea and vomiting, abdominal pain, breast tenderness, headache, dixxiness, and fatigue.

Safety: WHO notes specifically that women with previous ectopic pregnancy, cardiovascular disease, migraines, and liver disease and women who are breast-feeding may use ECPs. Although no changes in clotting factors have been detected following combined ECP treatment, progestin-only ECPs or insertion of a copper IUD may be preferred for a woman who has a history of stroke or blood clots in the lungs or legs and wants emergency contraception. Data are not available on the safety of current regimens of ECPs

if used frequently over a long period of time. However, experience with similar regimens and with high dose oral contraceptives suggests that the likelihood of serious harm from at least moderate repeat use is low. Certainly, repeated use of ECPs is safer than pregnancy, in particular when the pregnancy is unintended and women do not have access to safe early abortion services (WHO).

There is always a concern of repeated use or misuse of this method instead of using conventional oral pills or other contraceptive because it need not to be used it everyday or be used continuously. Women need to be educated for this and also side effects to prevent it misuse. This pill is available free of cost at all hospitals, community health centers and primary health centers being run by the Government.

Comments: Handling of misconception prevalent among providers and users is important. EC is considered by some women as abortifacient so could be unsafe. It is also believed that promotion of EC could promote promiscuous behavior. Health providers also believe that regular contraception is not required if EC is available. Involvement of religious and community leaders is lacking for acceptance of emergency contraceptive. Awareness among gynecologist about EC is low so it expected to have much lower level of awareness among general population. Emphasis in the program must be on increasing awareness about them. Locally produced ECs are required so that cost of the drugs can be brought down and can be made available in general stores. Strong commitment from politicians and people is required beside dedication of health professionals.

Expanding contraceptive choices in RCH II

International evidence shows that increasing the availability of contraceptives choice, increases acceptance rates. It is estimated that for every additional method added the contraceptive prevalence rate increased by 12 %. Wider contraceptive choice, including natural methods, helps meet the changing needs of couples during their lives. Multiple methods make switching easier reduce method-specific discontinuation and improve user satisfaction. Contraceptive choice can be expanded by both adding new methods to the existing range and increasing access to the services which are providing the choice. There are several possible additions that would improve the range of choice offered by the RCH II program:

Injectable contraceptives

Injectable contraceptives contain only progesterone. They are highly effective method of contraception. There are two types of progestin only injectables available: DMPA (Depo-Provera) once in 3 months and NET EN (Noristerat) once in 2 months. Progestin only injectable contraceptives are highly effective, have few side effects (amenorrhea, irregular bleeding, and a delayed return to full fertility). Injectable contraceptives do not interfere with sexual intercourse, no continuous use of the daily pill, and can be used confidentially by the woman. They are effective almost immediately and do not affect breast-feeding. Health benefits include decreased menstrual cramps, reduced menstrual bleeding thereby improving anemia, protection against endometrial cancer and decrease in benign breast diseases. Few side effects such as amenorrhea after continued use for one year have been reported.

The Lactational Amenorrhea Method (LAM)

LAM is based upon the natural infertility experienced by breast-feeding women, especially during the early postpartum months. LAM is now being promoted as a contraceptive choice to women. LAM is approximately 98% effective as long as *all* the following conditions are met:

- The mother is less than six months postpartum.
- The woman's menses have not returned.
- The mother is "fully or nearly fully" breast-feeding her baby (whenever the baby cries, at least 6 times a day including night feeds, the baby is being fed exclusively from the breast and intervals between feeding are less than four hours during the day and six hours at night). However, it is not a reliable method.

Standard Days Method (SDM)

The Standard Days Method (SDM) is a simple method based on fertility awareness; the woman learns how to tell when the fertile time of her menstrual cycle starts and ends. It is based on WHO data that women who usually have a 26 to 32 day cycle are potentially fertile from day 8 to day 19. SDM allows the woman to identify the days in each cycle when she is least likely to become pregnant if she has unprotected intercourse. There are innovative aids to assist women to keep track of their cycle such as CycleBeads™. This method is natural and has no side effects but high degree of motivation of the couple is required.

Centchroman

This oral contraceptive does not contain any steroidal hormones, developed by the Central Drug Research Laboratory, Lucknow. It is marked under the brand names "Saheli" and "Centron". It is taken twice weekly for initial 2 months and thereafter once a week and has no known side effects, except that in about 8% of users there is delay in menses. It is advised to use barrier method for the initial 2 months of start. Fertility typically returns within six months of discontinuation of Centchroman. However 80% of the women do not know about them (Vatsayan A et al 1996).

3. Sterilization services

Important steps include promotion of non-scalpel vasectomy for increasing male participation. Other steps include the emphasis on Minilap tubectomy services, accreditation of private providers and NGOs for service delivery, and increasing the pool of trained service providers (Minilap, Laparoscopic sterilization and non-scalpel vasectomy).

Under the Compensation Scheme for sterilisation acceptors, compensation is provided for loss of wages to the beneficiary and payments made to the service provider (and team) for conducting the sterilization procedure (Table 8.15). The compensation in cases of failure of sterilisation, medical complications or death resulting from sterilisation, and indemnity cover to the doctor/health facility performing sterilization procedures is provided through the Family Planning Insurance Scheme.

Female Sterilization (Tubectomy): Tubal ligation provides permanent contraception and is a safe, simple surgical procedure which can be performed on an outpatient basis under local anesthesia. It requires little surgical time, causes minimal discomfort to the client who can be discharged 2-4 hours after surgery. The two most common methods employed are laparoscopy and minilaparotomy. Laparoscopy requires expensive equipments and well-trained surgeons or Obstetric / Gynecology specialists. Counseling to ensure informed consent is of particular importance in sterilization programs because the method is intended to be permanent. The failure rate in the first year for minilaparotomy is 0.4 – 1% and for laparoscopy is 0.1 –0.5% in the first year. According to NFHS-3, 37.3% of currently married women in India have accepted female sterilization.

Table 8.15: Monetery incentive for accepting permanent sterilization

Category	Breakage of Compen	Acceptor	Motivator	Drug Dressing	Surgeon Charge	Anesth	Staff nurse	OT tech	Refresh ment	Camp	Total
High focus 18 states	Vesectomy (to All)	1100	200	50	100	-	15	15	10	10	1500
	Tubectomy (to All)	600	150	100	75	25	15	15	10	10	1000
Non-High Focus 17 states/UTs	Vesectomy (to All)	1100	200	50	100	-	15	15	10	10	1500
	Tubectomy (to BPL/SC/ST)	600	150	100	75	25	15	15	10	10	1000
	Tubectomy	250	150	100	75	25	15	15	10	10	650

Male Sterilization (Vasectomy): Vasectomy is a highly effective, safe and permanent method of sterilization for men. Men still produce semen and have the same sexual feelings, desire and capabilities. Vasectomy does not cause impotence, weakness or decrease in man's ability to perform work and support the family. There are two methods "conventional vasectomy" and "no scalpel vasectomy (NSV). Conventional vasectomy procedure involves making either one or two small incisions in the scrotum and requires blunt and sharp surgical dissection. Risk of hematoma is always present. No-scalpel vasectomy is a modified, sophisticated technique that requires no incision, less damage to tissue, only a small puncture, easier and faster procedure and therefore no stitches. It is a safe, simple procedure that can be performed in low-tech, low-resource setting (Li 1976, 1991). The failure rate is usually 0.2 – 1% in the first year. The current acceptance of the method in the country is 1% (NFHS-3) which was 1.9% in NFHS-2. To promote male sterilization government is providing cash assistance of Rs. 1100 per beneficiary in Delhi.

4. Comprehensive abortion care

The proportion of abortions range from 9%-15% of the total pregnancies. It is reported that more than half a million abortions are legally performed every year and more than this number is performed illegally which endangers the life of women. Trained manpower in Medical Termination of Pregnancy (MTP) should be made available in most of the places where abortions are performed. Still the conditions are poor and 8.9% of maternal deaths every year in India are due to septic abortion or unsafe abortion and 50% of all maternal deaths in 15-19 year age group contributed by abortions. The knowledge about facilities for safe abortion is very poor. Only 13% of women in India knew that abortion are legal and 0.3% of them know that it is legal upto 20 weeks of pregnancy.

In Jharkhand 10% of the reported abortion are carried out through unsafe methods, of which 51% have post abortion complications. In Madhya Pradesh 29% of women brought to hospital suffer from post abortion complications. In Maharashtra, KEM study showed that 67% admitted women reported complications of which 69% were life threatening and 3% resulted in deaths. In JIPMER (1999), 42% post abortion complications and 24% hospitalization (TOI 18th May 2008) occurred following unsafe abortion.

National Institute of Health & Family Welfare has identified institutions for MTP training, specialized skill training, although as of now there are many recognized MTP training centers in the country. At PHC/CHCs or subdistrict level if the trained manpower is not available then Safe Motherhood consultant can be hired to conduct MTPs. These doctors are being paid at the rate of Rs. 800/- per day visit. Over the year where the MTP can be performed has increased and now there are 11025 MTP clinics in the country.

The pregnancy test to detect pregnancy at an early stage addresses several issues relating to maternal health, including early detection of unwanted pregnancy and provision of safe abortion facilities. These Pregnancy Testing Kits are already part of the RCH programme and are supplied under the brand name Nishchay to all the SHCs in the country.

The strategies for providing safe abortion services are the provision of Manual Vacuum Aspiration (MVA) facilities and medical methods of abortion in 24 X 7 Primary Health Centres. The comprehensive Medical Termination of Pregnancy (MTP) services are to be made available at all District Hospitals and Sub-district level hospitals with priority given to 'delivery points', and also by encouraging private and NGO sector to provide quality MTP services. The certification and regulation of private and NGO sector providers to provide quality MTP services should be done through the district level committees within the framework of the MTP Act. Capacity building of Medical Officers, to equip them with skills necessary to provide safe abortion services at PHC level and above; of ANMs, ASHAs, field functionaries and RMNCH Counsellors to provide confidential counselling for MTP and post-abortion care, including family planning and orientation of obstetrician-gynaecologist faculty of Medical Colleges in the latest technology and non-clinical aspects of comprehensive abortion care are important elements in the provision of abortion care

Medical Abortion (MTPill): Termination of early pregnancy with 2 drugs Mifepristone (RU 486) and Misoprostol have undergone extensive research and

is considered extremely safe under supervision with appropriate counseling. Use of Mifepristone (RU 486) followed by Misoprostol is an established and safe method for terminating early pregnancy. Currently its use in India is recommended up to 7 weeks (49 days of amenorrhea) in a facility with provision for safe abortion services and blood transfusion. Prescribing doctor must assess the presence of pregnancy and rule out ectopic pregnancy, IUD, or any other disease such as chronic adrenal failure, on corticosteroid therapy, allergy to mifepristone, blood coagulation disorders.

Dosage and administration: On day one three tablets (total 600 mg) of Mifepristone should be taken in a single dose. On day three, Misoprostol 2 tablets (400 microgram) should be given. Woman should come after 14 days for follow-up to confirm MTP.

Another method is giving mifepristone 200 mg orally followed 1–3 days later by misoprostol 800 mcg (4 tablets of 200 mcg) vaginally. The misoprostol may be administered by a clinician or self-administered by the woman. For women at 49–63 days of gestation, if abortion has not occurred 4 hours after administration of misoprostol, a second dose of misoprostol 400 mcg (2 tablets of 200 mcg) may be administered vaginally or orally (depending upon preference and amount of bleeding). The patient should return for a follow-up visit approximately 14 days after the administration of mifepristone. This visit is very important to confirm by clinical examination or ultrasonographic scan that a complete termination of pregnancy has occurred.

Appropriate and approved medical abortion drugs are to be included in the essential drug list and availability of these drugs along with the necessary equipment has to be ensured in the public sector facilities.

COMMENTS

In India it is estimated that 6.7 million abortions take place every year out of which 2 million are spontaneous and 4 million are induced. Of the induced abortions, nearly 5-6 lakh are legal and rest are estimated to be illegal (ICMR 1989). This is mainly because of inaccessibility of safe abortion services, un-affordable private services, ignorance, poor quality of government facilities, rude behavior and stigma attached with pregnancy of unmarried girls. These issues are not in the preview of health department only but department of science and technology, human resource, social justice, and women empowerment should also take active part in solving them. Program should also focus on media for generating healthy debate on abortion and acceptance of unmarried girl who get abortion. Unsafe abortions among teen age girls are life threatening. But such threat is not deterrent for unprotected sexual intercourse. These tender age groups require more quality services such as counseling, user-friendly contraceptive methods, and safe and secure abortion facilities.

MULTIPURPOSE PREVENTIVE TECHNOLOGIES FOR REPRODUCTIVE HEALTH

As a critical first step, in 2009 an **International Symposium was held in Berkeley, California,** that convened 150 multidisciplinary participants from 11 countries, with expertise in product development, engineering, Behavioral science, clinical care, and advocacy to address the opportunities and challenges of advancing the development of MPTs. A decision was made to form the **Initiative for Multipurpose Prevention Technologies (IMPT)**. MPT is fusion of three interventions for HIV prevention, STI prevention and pregnancy prevention- all by single technology.

It includes following formulations-

1. Drugs:

- ❑ Contraception
  - Semi solid gels
  - Vaginal suppositories
- ❑ HIV
  - Tenofovir gels
  - Oral pre-exposure prophylaxis
  - Dapiverine rings
- ❑ STDs
  - Polyanion gels-bacterial vaginosis
  - Probiotics

2. Devices
   - The SILCS Diaphragm with tenofovir gel
   - Woman's Condom makes it possible to include any microbicide in a film formulation in the fast-dissolving insertion capsule and deliver it to the upper vagina and cervix.
   - Intravaginal rings (IVR)
   - IVR with MIV-150, zinc acetate, carrageenan gel, and levonorgestrel (LNG)- against HIV+HSV2

- LNG/tenofovir IVR

3. Vaccines
   - ❑ Combination vaccines
   - MPT vaccine candidates or components could include **antivirals** against HIV, HSV, or HPV;
   - Vaccines against bacterial infections such as the four major curable STDs (chlamydia, gonorrhea, syphilis, trichomoniasis); or even contraceptive vaccines targeting human chorionic gonadotropin (HCG) or sperm.
   - Even vaccines against malaria or tuberculosis might be future MPT components.
   - Therapeutic HPV vaccines are also being explored for cancer cervix.

Strategies to expand contraceptive choice in RCH II

1. Expanding the range of RCH services: Each CHC and PHC will have at least one MO trained in one sterilization method.

2. Improving and integrating RCH services in PHCs and Subcenters: The capacity of Lady Health Visitors (LHVs) and Auxiliary Nurse Midwives (ANMs) will be built through skill-based clinical training for spacing methods, infection prevention, counseling, and MIS.

3. Training of District hospital/CHC/PHC staff: to offer an expanded choice of services and will ensure quality of services and follow-up of the clients.

4. Forging linkages with ICDS division of women and child development department: AWW of ICDS will be trained and be actively involved in community mobilization and counseling clients and providing them with spacing methods including oral pills, condoms, LAM and SDM.

5. Engaging the private sector to provide quality family planning services: Public-private partnerships can stimulate and meet demand and have a synergistic impact on the RCH II. To ensure efficient and good quality services from the private and public sectors, robust monitoring and regulatory mechanisms will be developed.
   a) Incentives and training to encourage private providers to provide sterilization services: Unless there are incentives for the private sector to venture into this area, its involvement is unlikely. So there is a provision of fixed payments for clients served.
   b) Encouraging the use of public facilities by private doctors on a fee-sharing basis: Private doctors will be allowed to use public facilities on a fee sharing basis, e.g. in the evening when CHC/PHCs are normally closed.
   c) Regulation and accreditation of public and private sector facilities.
   d) Providing Safety Insurance Cover: Private sector providers may be reluctant to collaborate due to the fear of criticism and litigation. Insurance schemes to indemnify private providers, will serve as an incentive to provide family planning services with the government.

6. Stimulating demand for quality Family Planning services.
   a) Increasing compensation:
   - The Mission steering committee group of NRHM approved further revision in the compensation package to acceptors of vasectomy (from Rs. 800 to Rs. 1500) and tuberctomy (from Rs. 800 to 1000) in public facilities and Rs. 1500 for both vesactomy and tubectomy in private accredited health facilities to all catagories in HF states and to BPL, SC/ ST in non HF states (Table 8.4).
   - Rs. 20 for IUD to all state in public facilities and rs. 75 (inclusive of cost of the IUD for accredited private/ NGOs facilities in EAG states only.
   - Private providers providing sterilization in public health facilities will be paid compensation of Rs. 100 per case of vesectomy and Rs. 75 per case of Tubectomy subject to a maximum of Rs. 1000/day.

   b) In case of failure of permanent methods the acceptor will be eligible for safe Medical Termination of Pregnancy and compensation of Rs. 5000.
   c) Using the media.
   d) Involving satisfied users.
   e) Increasing the gender awareness of providers and increasing male involvement.

f) Social Marketing.

A few concerns are being expressed about free supply scheme. These are as follows:

- The end-user does not attach value to the contraceptives, as these are free of cost.
- The quantity supplied under the Free Supply Scheme is prone to wastage.
- The wastage is not only at the consumer level but also along the disbursement line.
- The contraceptives are available on working days only, at limited outlets and that too for a fixed time when the service provider is available.

Social Marketing Scheme

Social Marketing is a process of bringing about a social change which in this instance relates to changing attitudes towards health and health behavior pattern. It is to generate demand for health care services from those who need health interventions but are presently not seeking it. This is also an understanding of the barriers to access and designing an eye care delivery system that overcomes these barriers. Basically it is an application of marketing principle for the welfare of public.

In view of the inherent weaknesses of the free distribution of contraceptives and also to attach value to the product, the National Family Welfare Program initiated the Social Marketing Program of condoms in 1968 and that of Oral pills in 1987. Under the Social Marketing program, both condoms and oral pills are made available through Social Marketing Organization (SMOs) to the people at highly subsidized rates, through diverse outlets. The extent of subsidy ranges from 70% to 85% depending upon the procurement price in a given year. The SMOs are given Deluxe Nirodh condom at Rs. 2.0 per packet of 5 pieces and this is given @ Rs. 3/- per packet of 5 pieces to the consumer. One cycle of oral pills, which is required for one month, is given to the SMOs @ Re. 1.60/- and it is sold to the consumer @Rs. 3/- per strip (cycle) under the brand name "Mala-D". Under the program, currently three Government brands and thirteen different SMOs brands of condoms are sold in the market. Similarly for oral pills, one government brand and eight various SMOs brands of pills are being sold. Department of Family Welfare had sanctioned projects to undertake Social Marketing of Contraceptives in various states. A project of Health Care Dispensers was launched along with other fast moving consumer foods like chocolates, biscuits, boroline, band-aid, soft drinks, coffee and tea. Sale of contraceptive-condoms and OCPs is made through these dispensers. A project for installation of Condom Vending Machines (CVMs) in high prevalence districts of HIV/AIDS has been approved

7. Involving Panchayati Raj Institutions, Urban local bodies and NGOs:
   a) Establishing depot holders to increase coverage of family planning services.
   b) Building partnerships with NGOs.
   c) Building new partnerships for expanding contraceptive use: by involving District Urban Development Authorities (DUDAs) and Cooperative societies.
   d) Involvement of industrial groups

8. Studies and Operational Research: Operational Research is the application of quantitative methods to the solution of management problems. It includes a 'systems approach' in a large number rather than a few factors being considered by a group of scientists from different field. Use of scientific methods of analysis to process complex information and arrive at decisions thereby achieving an optimum balance of probabilities as well as identifiable facts. Important areas for operational research will include:
   - Male involvement and issues affecting male behavior and attitude.
   - Behavioral and operational barriers to women accessing contraceptive services.
   - How can effective linkages be most efficiently build with the different cadres of field workers from different departments?
   - Mechanisms to involve women in planning/ monitoring health services.
   - Identification and dissemination of best practices in the area of contraceptive services.

Family Planning Insurance Scheme

Government of India has launched Family Planning Insurance Scheme in November 2005 for acceptors of sterilization and indemnity insurance cover for doctors performing sterilization procedures in both Government and accredited private/NGO/Corporate health facilities. The scheme/policy up to December

2010 has been given to ICICI with the amount for sterilization failure for Rs. 25,000 to Rs. 30,000 and other benefits to acceptors. The insurance cover is also being provided to all doctors/health facilities of Central, State/local Self Government/other public sector and all the accredited doctors/health facilities of NGO and private sector rendering Family Planning Services against the claims arising out of failure of Sterilization death or medical complication resulting from Sterilization operation upto a maximum amount of Rs.2 lakh per doctor/health facility. The cover would also include the legal costs and actual modality of defending the prosecuted doctor/health facility in Court, which would be borne by the Insurance Company within certain limits. There might be cases not covered by the family planning insurance Scheme, viz. cases of sterilization operations conducted before coming into forces of this insurance scheme, cases not covered under the national protocol, cases already pending in courts etc.

This scheme is the continuation of family welfare linked health insurance scheme implemented by Ministry of Health & Family Welfare a centrally sponsored scheme since 1981 to compensate the acceptors of sterilization for the loss of wages for the day on which he/she attended the medical facility for undergoing sterilization.

Apart from providing for cash compensation to the acceptor of sterilization some states/UTs were apportioning some amount for creating a miscellaneous purpose fund being utilized for payment of ex-gratia to the acceptor of sterilization or his/her nominee in the unlikely event of his/her death or incapacitation or the procedure of Sterilization, as under:

i. Rs. 100,000/- per case of death
ii. Rs. 30,000/- per case of incapacitation
iii. Rs. 20,000/- per case of cost of treatment of serious post operation complication.
iv Rs. 20,000/- Death within 30 days of discharge
v Rs. 20,000/- Failure of sterilization /medical complications

National Population Education Program

This program was launched in 1980 for institutionalization of population education in the education system of the country. With the assistance of UNFPA the government is running four projects involving department of education of Ministry of HRD and Ministry of Labor. These projects are the regular activities under 10th Plan.

1. Population Education in the School Sector: The objective of this project is to institutionalize population education in the content and process of school education. The project has been implemented by NCERT at the national level and SCERTs at the state level. NCERT has developed module on adolescent health education in schools.
2. Population Education in the Higher Education System: Seventeen Population Education Resource Centers covering universities and colleges all over the country are functioning with emphasis on national capacity building, adolescent education and improved management system.
3. Adult Literacy Program: It is operational since 1987 and Directorate of Adult Education is implementing it at the national level and State resource centers, regional resource centers in states.
4. Vocational Training Program: As an integral part of social studies curriculum in Vocational Training programs, population education has been included in industrial training institutions through Director General of Employment and Training (DGET), Ministry of Labor.

Important Terms

Population control is the major objective of family welfare program. Over a period this has been realized that population control can not be achieved individually rather overall development of the women and family as a whole is of paramount important. To measure the status of population control following terms need to be understood:

Birth Rate (BR)

$$\frac{\text{No. of live births in an area in one year}}{\text{Average or midyear population in that area and year}} \times 1000$$

Birth Control: Some couples attempt to regulate the number and spacing of their children by adopting practices that permit sexual intercourse with reduced likelihood of conception. Such restriction of births or limitation of births, either temporary to achieve the desired interval between successive births or

permanently to prevent more births than desired, is called birth control.

Contraceptive Prevalence Rate: The percentage of married women of childbearing age who are using or whose husbands are using any form of contraception, whether modern or traditional.

Gross Reproductive Rate: Gross reproductive rate is a measure of the number of daughters a cohort of women can have. Since the total fertility rate measures the total number of children a cohort of women can have, the gross reproductive rate becomes a special case or a part of the total fertility rate.

Growth Rate of Population: A measure of population growth (in the absence of migration) comprising addition of newborns to the population and substraction of deaths. The result, known as natural rate of increase.

$$GR: \frac{\text{Live birth - deaths during the year}}{\text{Midyear population}} \times 1000$$

Fertility Rate: The ratio of the total number of births in a given population, during a given period, borne to women in the reproductive span of her life during that period is called fertility rate.

Age-Specific Fertility Rate: The number of births occurring during a specified period to women of a specified age group, divided by the number of person-years lived during that period by women of that age group. When an age-specific fertility rate is calculated for a calender year, the number of births to women of the specified age is usually divided by the midyear population of women of that age.

Total Fertility Rate: is the average number of children that would be born alive to a woman during her life time if she were to pass through her child bearing years conforming to the age-specific fertility rates of a given year.

Net Reproduction Rate (NRR): The average number of female children born per woman in a cohort subject to a given set of age-specific fertility rates, a given set of age-specific mortality rates, and a given sex ratio at birth. This rate measures replacement fertility under given conditions of fertility and mortality: it is the ratio of daughters to mothers assuming continuation of the specified conditions of fertility and mortality. An NRR of 1.00 means that each generation of mothers is having exactly enough daughters to replace itself in the population.

Zero Population Growth: A population in equilibrium with growth rate zero, which will be achieved when births plus immigration equal deaths plus emigration, is called zero population growth.

Zero population growth means no population increase or decrease. A population could reach this equilibrium in one of the following ways:

1. Birth equaling deaths (as would happen in a population that reached the replacement level of fertility for a long time) and net migration is zero, or
2. Births exceeding deaths, but the surplus is balanced by net emigration; or
3. Deaths exceeding births, but the deficit is balanced by net immigration.

Efforts of population control are continuing since the time of independence but population control is still a big challenge in front of India. There are successful stories and big achievements but they are not uniform. Some states are comparable to any developed nation but others are far from satisfaction. The five Empowered Action Group (EAG) states of Bihar, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh, together with the three new states formed in this region, Jharkhand, Chattisgarh and Uttaranchal had an estimated combined TFR of 4.2 in 2000. For this region as whole it would take another 26 years to reach replacement fertility under the current rate of decline.

There are various reasons for people not using contraceptives in India: want more children, want male child, objection from husband or elderly in family, religious reasons, health reasons, fear of side effects, breast-feeding, and infertility (Kansal A et al 2006). Other reasons are poor knowledge, non-availability, poor choice of contraceptives and inappropriateness of contraception.

Top priority areas for research in Family Planning:
Family Planning 2020 initiatives (Ali Met al 2014) has advocated following areas of research in family planning:

1. Identify the main barriers to uptake and use of modern contraceptives in settings with very low prevalences of contraceptive use;
2. Identify mechanisms to integrate postpartum FP services with other interventions, such as child vaccination and control of HIV infection, to improve health care and uptake of FP services;
3. Determine strategies to increase post-abortion contraception uptake and continuation;
4. Identify effective strategies to overcome the barriers to contraceptive uptake in the postpartum period;
5. Develop mechanisms to improve the physical, financial and social access of marginalized populationsa to FP products and services;
6. Investigate the determinants of the discontinuation and switching of contraceptive methods;
7. Evaluate the unmet need for FP, particularly that among marginalized populations;
8. Investigate the determinants of acceptability and continuation of use of FP methods in marginalized populations;
9. Identify strategies to ensure that integrated services for maternal health and FP are effectively adopted by governments;
10. Identify mechanisms to prevent out-of-stock events in contraceptive supply systems.

5. MANAGEMENT OF SEXUALLY TRANSMITTED AND REPRODUCTIVE TRACT INFECTIONS (STI and RTI)

Burden of Disease

Reproductive tract and sexually transmitted infections (RTI/STI) have been recognized as a public health problem. In Mumbai the prevalence of any reproductive problem in married women was 54% where as it was 29% in Kolkata (NFHS-II). In another community based study the prevalence rate of STIs 11.75% and was more in females (20%) than males (3.5%) (Jindal 2009). The prevalence differs from region to region in India. Its severity became more clear when the relationship between HIV infection and RTI/STIs is established. In spite of having infections many women do not seek any advice or treatment. Their early diagnosis and treatment could avert the severe consequences of STIs. Data from India have brought them onto the reproductive health agenda (Table 8.16).

Objectives under RCH II

- Promote recognition and referral for those with suspected RTI/STI.
- Strengthen services for diagnosis and treatment of RTI/STI at PHCs, CHCs, FRUs and district hospitals.
- Strengthen linkages and synergy with NACO activities.

Strategies

Community level

- Train and permit ANMs to provide presumptive treatment to cases and their partners for common RTIs/STIs; provide first line drugs in ANM's kit.
- Train AWWs and link volunteers to identify/refer cases of RTI/STI.
- Promote community awareness regarding RTIs/STIs for prevention, early care and treatment.

Facility level

- Operationalize services for the diagnosis and comprehensive treatment of RTI/STI at all FRUs, all CHCs and at least 50% PHCs.
- Revise essential drug list.
- Post technicians, strengthen laboratories, and ensure availability of supplies.
- Provide 1st line drugs at remaining PHCs.
- Train MOs and LHVs.

Operational research

- Refine and test syndromic algorithms for the treatment of RTI/STIs.
- Estimate burden of RTIs/STIs and sensitivity of the causative organisms.
- Assess utility of microbicides in preventing RTIs/STIs.
- Assessment of awareness and impact of IEC or behavior change communication among patients and community.
- Assess quality of services for RTIs/STIs at the health care settings.

The services are to be provided at all CHCs and FRUs, and at 24 X 7 PHCs. The provision of these services should first be made at all identified 'delivery points'.

Table 8.16: RTI & STI prevalence among women in India

Study Population	Prevalence (%)								
	NG	CT	Syphilis	TV	HSV (clinical)	HPV (clinical)	Cervical dysplasia	HBV	HIV
Community-based									
Unmarried & married women	0.3-4	5	0.2-10	0.8-14	2.0			4.8	1-2
Facility-based and convenience samples									
STD clinic patients	1-16		29-43		4-15	7-15			1-13
Sex workers	5-16		30-63			0.5			50
Gyn. OPD	1-5	0.2-31	4-6	0.4-26	0.3-25	0.6-42	9% Severe		
5% malignancy									
ANC		2.3	1-6	18					0.1-1
Gyn. OPD: 'vaginitis'	0.0-3	3-12	2.2	1.6-18					
Gyn. OPD: cervical erosion		3.0					2% moderate 13% Severe 1.8% malign		
Infertility and PID patients	0.1-11	0.5 -24.2	0.5	0.5					
Acceptors of tubal ligation	0.1-2	0.0-0.2	0.5-7	0.9					

NG= Neisseria gonorrhoeae; CT= Chlamydia trachomatis; TV= Trichomonas vaginalis; HSV= Herpes Simplex Virus; HPV= Human Papilloma Virus; HbsAg= Hepatitis B surface Antigen; HIV= Human Immunodeficiency Virus (*UNFPA 2001, RCH-II 2005, Jindal 2009)*

Convergence with the National AIDS Control Programme (NACP) is essential for the provision of services for case management, laboratory services, HIV counselling services, anti-retroviral drugs, equipment and blood safety. For syndromic management of RTIs/STIs, availability of colour-coded kits, RPR testing kits for syphilis and also whole blood finger prick testing for HIV should be ensured first at the delivery points and then at all levels of facilities and with service providers trained in syndromic management of STI and RTI.

URBAN HEALTH

Health indicators of urban areas are better than rural areas (Table 8.17). But RCH indicators in urban slums are worse than the urban average. Even in urban areas as detected in one study, the use of any contraceptive is 53% which is around the national average. Among reproductive age group women, unmet need of

Table 8.17: Difference between rural and urban India

Characteristics	Urban	Rural
Population age 6+ that is literate (%)	81	61
Mean household size	4.6	4.9
Have electricity (%)	93	56
Piped drinking water (%)	71	28
Assess to toilet facility (%)	83	26
All vaccine coverage in 12-23 months	58	44
Children < 3 yrs Underweight	36	49
Children < 3 yrs Diarrhea receive ORS	33	24
IMR (per 1000 live births)	42	62
Married using any contraceptives	64	53
ANC 3 visits in last pregnancy	73	43
Birth Attedend by Trained personnel	75	39
Institutional Deliveries (%)	69	41
HIV/AIDs Knowledge in married adults	81	46

contraception is 21%. Among them 39% are willing for sterilization (Andurkar et al 2006). The Krishnan Committee report on "Reorganization of Family Welfare and Primary Health Care services in Urban Areas", 1983 is a landmark in the area of urban health policy. The Committee proposed an integrated primary health care structure in consonance with the National Health Programs. The Urban revamping Scheme based on the Krishnan Committee's recommendations was started in 1984 in 10 states.

True picture of urban slums is worst than other urban areas. There is around 50-60% of the population of urban areas that lives in urban slums where basic facilities such as water, sanitation, health, electricity etc. are poor. Health care facilities are not adequate. Maternal and child morbidity and mortality is high due to poverty, poor nutrition and poor education. Children living on payments and slums are more exposed to drug abuse, child labor, and sexual exploitation.

Recognizing the seriousness of the problem, the Government of India has identified Urban Health as an important element of the eleventh Five Year Plan; National Population Policy, 2000; National Health Policy 2002 and the RCH II Program. In Twelveth Plan the National Rural Health Mission is converted into National Health Mission including urban health mission.

National Slum Policy (Draft) 2002

The policy focuses on health services under the section of improving access to social services. It emphasizes the need to ensure basic health care for the urban poor and outlines four areas to improve the health delivery system:

- Community involvement in the all aspects of health care delivery. Capacity for participatory community involvement should be built by the urban local bodies.
- Demand for health services-this includes demand for basic preventive services and access to curative services. The policy also states the need to focus on hygiene behaviors, HIV/STI prevention, and strategies to tackle violence and alcoholism.
- Linkages with private medical practitioners in slums to ensure that curative services reach the peri-urban and slum levels.
- Health insurance to provide an economic security cover in case of hospitalization and medical emergencies.

Program goal

- To improve the health status of the urban poor community by provision of quality Primary Health Care Services with a focus on RCH services to achieve population stabilization.

Objective

- To provide an integrated and sustainable primary health care service delivery, with emphasis on improved Family Planning and Child Health services in the urban areas of the country, particularly for urban poor living in slums and other health vulnerable groups.

There are 423 towns and cities having a population of more than 100,000 (2001 census). These cities have been broadly classified into 4 main categories:

- Mega cities with a population of more than one crore.
- Million plus Cities.
- Large Cities with a population of 1 - 10 lakhs
- Towns with a population less than 100,000.

City level Task Forces has been established which plan the project. A nodal officer has been identified and a cell established at state level to plan, coordinate and supervise the Urban Health Projects.

Strategies

Urban health projects include the following key strategies:

- Improving access to RCH services through renovation, improvement and reorganization of existing facilities, redeployment of available state Government staff and establishing new facilities. Mobility support may be contracted in, and trained females volunteer work at community level.
- Strengthening existing urban health infrastructure at first and second tiers to cover all slum areas.
- Improving the quality of Family Welfare Services by increasing the supervisory, managerial, technical and interpersonal skills of all levels of health staff including female volunteers, through pre-service, in-service and on-the-job training.
- Participation and convergence of NGOs, private and other sector in urban PHC delivery.

- Stimulating the demand for RCH services through integrated BCC activities and enhancing the participation of communities and municipal leaders in the design, implementation and supervision of the services.
- Developing effective linkages and referral between the communities, 1st and 2nd tier service levels.
- Strengthening Monitoring and Evaluation mechanisms.

Service Delivery Model

Presently, Government of India supports 1083 Urban Family Welfare Centers (UFWCs) and 871 urban health posts (UHPs), and 3,239 beds under sterilization beds scheme. The postpartum centers (550 at district level and 1012 at subdistrict level) are funded by the State Governments. There are many other projects run by state Governments, Municipalities, NGOs and the private sector. There is a need of following:

- Integrating facilities run by state governments, municipalities and other agencies.
- Upgrading existing infrastructure.
- Establishing new rented facilities.
- A **first tier** of facilities (UHCs) should be set up, one for approximately 50,000 population with emphasis on reaching the most vulnerable.
- An appropriate number of **second tier** of facilities should be identified for referral (hospitals, maternity homes, private/NGO nursing homes etc.).
- The existing service delivery system should be **reorganized and restructured** to serve a defined area and population.
- Renovation and improvement of existing Government facilities should be preferred to new construction.
- Potential **private partners** for either tier should be identified to improve the coverage and quality of services and harness the skills of potential partners whilst ensuring equity of access for the poorest.
- **Opening hours of UHCs and types of outreach activities** should be decided in consultation so that they meet the local needs.

Package of services

Package of services recommended under UHCs are: a) provision of OPD services including a comprehensive package of RCH, simple curative, basic lab, counselling, depot holding and referral services to 2nd tier facilities; b) coordination of outreach activities through link workers and women's health groups; c) stimulate demand through integrated BCC activities; d) coordination with NGOs training link volunteers and provision of compensation for family planning acceptors; and e) Second tier facilities should provide tubal-ligation and vasectomy, institutional delivery, EmOC, safe abortion, and child/newborn care services.

Human Resources

Suggested UHC staffing pattern to cover a population of 12000-15000 population:

1 Medical Officer preferably Lady
1 PHN/LHV
3-4 ANMs
1 Lab assistant
1 Staff clerk with computer skills

Link volunteers (a woman from the community who is able to spare 3-4 hours a day, preferably selected by an NGO) are to promote services. The need for volunteers will be periodically reviewed. Where possible they will be integrated with other slum development activities to encourage sustainability and intersectoral collaboration. The capacities of link workers to facilitate health improvements in the community will be built by NGOs. Link volunteers will form women's health groups as the basis of health promotion efforts at the community level.

Activities that reach out to the most vulnerable and underserved will be planned as a means of stimulating demand and ensuring equity of access. The outreach service package, as a minimum, should inform on the availability and promote Family Planning, child health services (including immunization), counselling, household level new born care, safe delivery, ANC and safe abortion services. NGOs will be important partners in outreach activities.

Public-Private Partnerships for Urban health

Strong partnerships between the DoFW, GOI, state Government and the Urban Local Bodies (ULBs) will increase the chances of success and will be promoted. Such partnerships are particularly likely to be viable in urban areas. PPP initiatives based on social marketing and social franchising will be piloted. PPP approaches will need to be different depending on the context:

- In cities where 1st tier public health infrastructure (Health Posts or UFWCs) is already available, a partnership with NGOs could be proposed through training Link Volunteers, women's groups, social mobilization and BCC.
- In other cities, the entire first tier service delivery component and some of the 2nd tier services may be contracted out through partnership with a charitable hospital, NGOs or an appropriate private agency (based on the experience in IPP VIII in Kolkata and neighboring cities).

Coordination and inter sectoral convergence

Mechanisms for effective linkages and coordination between various departments and the private sector will be developed to improve, for instance, sanitation, drainage and water services.

Management and monitoring

Urban HMIS will be consistent with the national HMIS. Baseline indicators will be measured using the data already available from the District Health Survey and other available reports. Benchmarking will specially focus on contraceptive usage, terminal methods adoption, immunization coverage, TT coverage, safe abortion, safe delivery, infant and neonatal care. A state and district program management units may be established for the periodic review of program implementation and to undertake discussion and decisions on UH program activities.

Cost recovery mechanism and sustainability

Cost recovery will be integral to the proposal, keeping the principle of inclusion of the poorest and equity of access. Kolkata levied differential user charges on services provided, these were put in an amalgamated fund which was used to sustain project activities after the project period. Such a fund can be used after project completion for further development or sustainability. Others proposals are:

- User charges at 2nd tier (not for BPL) for diagnostic services, surgery etc.
- Registration fees/family health card charges from all families collected at first tier and during outreach camps.
- Donations from businesses and individuals.
- Funds from National Slum Development Program (NSDP): Urban Local Body (ULB) can access 5 times the amount generated at local level by communities from NSDP.
- A portion of lease/rental income from Municipal or Public sector buildings.

TRIBAL HEALTH

The tribal population in India is socioeconomically disadvantaged. Tribal communities are not one homogenous group; belonging to more than 400 different ethno-linguistic, religious and cultural groups. There are six predominantly tribal states where more than 50 percent population is tribal and another nine states where the majority of the scheduled tribe population lives.

BURDEN OF DISEASES

World

Historically, many indigenous people have suffered acts of genocide and lethal epidemics of diseases, carried by colonialists and settlers from other countries. Oppression, land expropriation and environmental degradation continue to threaten the livelihoods of many indigenous communities. Life for most is a struggle in the face of poverty, ill health and social disintegration, and institutional racism. Despite the important institutional developments that have taken place in the framework of the decade, indigenous peoples in many countries continue to be among the poorest and most marginalized.

Many communities are overwhelmingly affected by communicable diseases and nutritional deficiencies. Loss of lands and environmental degradation underlie much loss of livelihoods and food security. Indigenous communities often depend on ecosystems that are rapidly deteriorating through no fault of their own (van Oostdam et al. 1999, Merson 2000, Powell and Steward 2001). In some instances, indigenous peoples are exposed to environmental pollutants that have been prohibited in other parts of the world, such as the continuing use of DDT, Aldrin, and Dieldrin in the western highlands of Guatemala.

Indigenous peoples often have higher rates of mental illness manifesting as alcoholism, substance abuse, depression and suicide: for instance, Canadian indigenous youth have 2-6 time greater risk than non-indigenous youth (Single et al. 1999). These problems come in the wake of social disintegration caused by

modernization and the destruction of traditional authority structures and autonomous decision-making. Tribal peoples often have sophisticated and effective systems of traditional medicine (Crengle 2000, Hickmen and Miller 2001, Fink 2002). But they have recognized that they cannot address all their health problems through traditional medicine. Indigenous peoples often lack adequate access to basic allopathic health care when they need it (Pal et al. 2002, Simmons and Voyle 2003). Access is constrained by financial, geographic and cultural barriers. Indigenous peoples are low on governments' priority lists, especially when they live in remote areas where services may be difficult to provide, and population density is lower. Where services are available, indigenous people are often reluctant to afraid to use them because staff can be insensitive, discriminatory and unfriendly to them (Escobar et al. 2001, Palafox et al 2001). Many communities have little information on their rights and entitlement to health care. Health services need to be organized and tailored to enhance and collaborate with indigenous cultures and traditional health systems. A commitment to empowering indigenous people to make their own decisions about the nature of health services should lie at the core of health systems development.

India

The health and education indicators for tribal people are poorer than for the rest of the population and women and girls from these groups are particularly underprivileged. The tribal children have higher rates of morbidity, and female children are known to receive less than desired nutritional intake (Rao VK 1984). 34.2% of the tribal children had communicable diseases and ARI was leading cause (Giri VC et al 2008). Table 8.18 shows the different health indicators in scheduled castes and scheduled tribes in comparison to rest of the population. The main reasons for the poor health status of tribal people are:

- Poverty and undernutrition in both macro and micronutrients.
- Poor environmental sanitation, hygiene and lack of safe drinking water.
- Lack of access to health services.
- Social barriers preventing access and utilization of health services for specific diseases such as malaria, TB, Yaws, Sickle cell anemia and Thalassemia.

There is low utilization of health services in tribal areas because:

- Sparsely distributed tribal population in difficult forest and hilly regions.
- Poorly located subcenters, PHCs and CHCs.
- Service providers not in post.
- Lack of suitable transport facilities for quick referral of emergency cases.
- Lack of appropriate HRD policies to encourage/ motivate the service providers to work in tribal areas.
- Inadequate mobilization of NGOs.
- Lack of integration with other health and sector programs.
- BCC activities may be inappropriate.
- Services are not client friendly.
- There are cultural barriers to access.
- Non involvement of local traditional faith healers.
- Weak monitoring and supervision system.

Objectives

- Assess the unmet RCH needs in tribal communities.
- Provide integrated, appropriate and quality RCH services.

Table 8.18: Health Outcomes among Scheduled Castes, Tribes, and the rest of the Population in India

	%	Wealth index quintile (Poverty)					Caste/ Tribe			
India 2005-06 NFHS 3	*Total*	*Lowest*	*2nd*	*Middle*	*Fourth*	*Highest*	*SC*	*ST*	*OBC*	*GEN*
Infant mortality	57	70.7	69.2	60.6	42.3	33.6	71.0	63.9	61.1	55.7
Under 5 mortality	74.3	100.9	90.4	73.6	49.1	36.2	94.7	99.8	78.7	68.2
Measles vaccination	43.5	24.4	33.2	46.9	55.3	71.0	56.7	46.1	55.4	68.8
Underweight child<3Yrs	45.9	59.9	53.2	43.6	37.5	24.4	52.2	56.7	46.4	37.3
Overweight men	14.8	1.9	4.3	8.7	19.1	38.5	10.2	3.8	13.6	21.9

- Ensure equitable access to these services.
- Stimulate demand for these services.
- Improve service coverage and acceptability.
- Promote community participation and intersectoral coordination
- Provide opportunity for employment of tribal people
- Promote and encourage tribal systems of medicine

Strategies

Basic health and RCH services need to be integrated in the overall development of tribal areas. Tribal communities have many strengths, such as strong community bonds, positive value towards health and a strong faith in the traditional healing systems. The approach to tackle tribal health problems has to be multi-pronged, area specific and need-based. The seven states in the North East will require a different strategy since the education level is high in these areas and economically they are better than other tribal groups in the country. In order to increase utilization of health services by the tribal population, some suggested innovative approaches are:

- Involving the community in the planning process as well as in the management and implementation of services and programs.
- Using community-based workers (men and women) as social mobilizers, educators and providers of non-clinical services.
- Involving locally elected bodies including tribal boards.
- Involving NGOs.
- Promoting tribal systems of medicine, and tribal healers where appropriate.

Promoting community participation

Community Based Organization (CBO) should be motivated to take active part in the management of local services. Community Based Providers and volunteers will be trained to improve access and demand for services among the tribal population. In difficult terrain and sparsely populated areas it may be an advantage to have a team of men and women, preferably a married couple, working as CBO workers. This has been successfully implemented by SARTHI in 150 tribal villages of Gujarat and SEWA-Rural in Bharuch district of Gujarat. A large network of anganwadi workers is available in the tribal areas under the ICDS scheme. They will be involved in creating awareness and demand for services for women and children under BCC.

NGO and public private partnerships

Mapping of NGOs will be useful in tribal areas, and credible NGOs especially with a proven track record of clinical service provision should be encouraged to take responsibility for managing RCH and other health services in sub-centers, PHCs and CHCs where the public health system is deficient. Practitioners of Tribal system of medicine may be provided orientation and training to provide counselling services for RCH services, depot holding, for contraceptives such as condoms and pills and referal of clients to public health facilities for IUDs, sterilization, immunization, ANC and other services.

Communication Strategy

Behavior Change Communication (BCC) will be carefully developed to prioritize local behavior change objectives. A communication strategy needs to be based on the values, beliefs and practices of the tribal population, with regional differences and using tribal dialects in audiovisual presentations.

Support to infrastructure and service delivery

Facilities for EmOC will be established at block level. *Mobile clinics* can be very useful in providing curative and preventive care through regular visits on fixed days to subcenters. Teams may comprise of doctors (allopathic and/or ISM&H), ANMs and HWs (M). AWWs, Sahayika, PRI, NGO and traditional tribal medicine practitioners who will provide local assistance. Mini subcenters might be established in limited hilly, remote and difficult to approach areas, staffed by ANMs, with flexible population norms between 700 to 2000.

Human Resource development

Skilled assistance at birth will be promoted by piloting Community Midwife training involving Nursing Council of India. One approach might be to recruit local married women for training and assistance is setting up their services. This will need to be closely monitored to assess the quality of the services being offered.

North Eastern States

The states of Assam, Arunachal Pradesh, Manipur,

Meghalaya, Mizoram, Nagaland, Tripura and Sikkim have a large tribal population but present a different set of characteristics both demographically and geographically from the rest of India and will require different approaches.

MAINSTREAMING GENDER AND EQUITY IN RCH

Gender Discrimination in World

Feticide and infanticide: Modern diagnostic tools for pregnancy have made it possible to determine a child's sex in the earliest phase. Where there is a clear economic or cultural preference for sons, the misuse of these techniques can facilitate female feticide. Although there is no conclusive evidence to conform such illegal misuse, birth histories and census data reveal an unusually high proportion of male births and male children under five in Asia including India (Table 8.19).

Table 8.19: Showing Sex ratio since 1901

Year	Sex Ratio All Age	0-6 Year
1901	972	-
1911	964	-
1921	955	-
1931	950	-
1941	945	-
1951	946	-
1961	941	976
1971	930	964
1981	934	962
1991	927	945
2001	933	927
2011	940	914

Primary Education: For 100 boys out of school, there are 115 girls in the same situation. Missing out on a primary education deprives a girl of the opportunity to develop to her full potential. Evidence indicates that the under five mortality rate falls by about half if mothers are educated with primary school education (Unicef 2007).

Secondary Education: Secondary education has multiple benefits for women and children. It is singularly effective in delaying the age at which a young woman first gives birth and it can enhance freedom of movement and maternal health. It also strengthens women's bargaining power within households and is a crucial factor in proving opportunities for women's economic and political participation.

Female genital mutilation and cutting: Female genital mutilation/cutting involves partial or total removal of, or other injuries to, female genitalia for cultural and nonmedical reasons. It is estimated that more than 130 million women and girls who are alive today have been subjected to mutilation. Female mutilation can have grave health consequences, including the failure to heal, increased susceptibility to HIV infection, childbirth complication, inflammatory diseases and urinary incontinence. Severe bleeding and infection can lead to death.

Child Marriage and premature parenthood: Child or early marriage refers to marriages and unions where one or both partners are under the age of 18. Parents may consent to child marriages out of economic necessity, or because they believe marriage will protect girls from sexual assault and pregnancy outside marriage, extend girls' child bearing years or ensure obedience to their husband's household. Premature pregnancy and motherhood are an inevitable consequence of child marriage. Girls under 15 are five times more likely to die during pregnancy and childbirth than women in their twenties (Figure 8.12 &8.13).

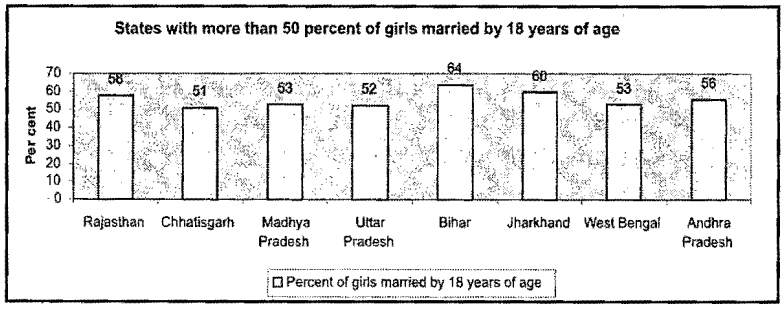


Fig. 8.12

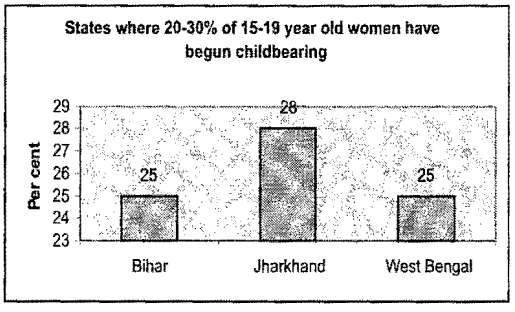


Fig. 8.13

Domestic Violence: Physical abuse and violence is common against women in their home and workplaces. In a study it is found that 61.5% of the women has been abused physically. They had been slapped and kicked by their husband (Raikar MM et al 2008).

Sexual Abuse, exploitation and trafficking: 150 million girls and 73 million boys under the age of 18 experienced forced sexual intercourse or other forms of physical and sexual violence in 2002. An estimated 1.8 million children are involved in commercial sex work (Unicef 2007). Because unprotected sex carries the risk of pregnancy and sexually transmitted infection, including HIV, knowledge of sexual and reproductive health is essential for the safety of young people.

HIV/AIDS: Women are at a greater risk of contracting HIV than men because women are at least twice as likely as men to become infected with HIV during sex. High rates of illiteracy among women prevent them from knowing about the risk of HIV infection and possible protection strategies.

Women in Old age: Elderly women may face double discrimination on the basis of both gender and age. Women tend to live longer than men, may lack control of family resource and can face discrimination from inheritance and property laws.

Gender mainstreaming means taking gender out of its enclave of "women's work" and embedding it in a sustainable human development and human rights agenda supported by both men and women. Many organizations have some gender specific policies in place, ranging from resource allocation to policies against sexual harassment, to hiring practices and maternal and paternal leave, etc. However, less apparent structure that perpetuate discrimination such as institutional cultures should also be targeted for change. Initiatives such as gender mainstreaming capacity building programs and men's discussions group can create space for consciousness raising and self-reflection that ultimately leads to stronger, more effective and equitable organizations.

The family, education system, and religious institutions play key role in gender socialization, and these can also act as agents of transformation. In the family, increased involvement of fathers can have powerful effects on both boys' and girls' socialization. In schools, attention to empowering girls and efforts to pay attention to the ways in which male socialization steers girls away from intellectual pursuits, are vital steps. In religious institutions, spiritual leaders can act as role models who value compassion and community building over more constraining gender roles (Kaur 2005).

When there is a choice to be made it is often the girl who has a lower calorific intake, is breastfed less frequently, denied education, engaged in caring for siblings, cooking, cleaning, fetching water, fodder and fuel in rural areas. In urban areas, girls are involved in home-based work or as domestic help at very low wages, while boys are sent out to factories. The linkages between education, economic opportunities and livelihoods and access to health are not accidental. Even incremental improvements in status seem to translate into considerable benefits; delaying the age of marriage, first conception and better birth spacing. It is found that lower the status of women, the life expectancy at birth is also lower. Discrimination and neglect along with scarcity of resources increases the vulnerability for girl child. For girls in India, delayed, inadequate or no health care during illness contributes to the abysmally low sex ratio in India. Factors affecting access of female to health care is given in Table 8.20.

Gender cannot be viewed in isolation of social and economic status of people. While the overall poor quality of health services affects all, its affects on the poor are disproportionately high. Also it affects poor women much more than women from more privileged sections of society. Even among the poor the situation of untouchables and tribal communities is worse.

As women more than men tend to seek help for their children, integrated RCH II services for women and children are needed and they should be provided by skilled and gender sensitive health care staff. State PIPs and logframes must unequivocally address gender disparities in all operating procedures, service delivery practices and BCC activities without exception.

Gender: Policy

Government of India is committed at policy level to reduce the gender bias in public health and family welfare programs in RCH II. The shift in policy and program focus from family planning and fertility control to reproductive health must be completed. Family

welfare and women's health must be promoted as a shared responsibility between men and women.

Mainstreaming Gender in RCH II state PIPs and Log frames

Training officials and service providers should sensitize about the status of women, the indignities being faced by them on a daily basis, gender based violence, access to education, health care, nutrition, and control over fertility.

Realistic strategies and activities for state PIPs and Log frames

The strategy matrix identifies the social and economic barriers faced by women in accessing health care and corresponding service delivery system level actions or responses that can help address these barriers:

Lack of control over ones body, ones reproduction

- Provide access to contraceptives (spacing and terminal) within easy reach.
- Provide access to confidential safe abortion (husband's consent not mandatory).
- Provide access to health facilities and providers within reach.
- Provide counselling for both partners.
- Promote these services and stimulate demand for them.

Lack of mobility

- 24hr services within easy reach.
- Fixed day services.
- Make drugs and consumable available.
- Promote these services and stimulate demand.

Lack of access to resources

- Reduce cost of care.
- Introduce health insurance schemes.
- Build linkages with SHGs.
- Promote these services and stimulate demand for them.

Value/Stigma attached to certain services

- Educate community, PRIs and SHGs on gender and other RCH issues.
- Provide confidential and discreet STI/RTI and safe abortion services especially for adolescents.
- Ensure privacy and confidentiality.
- Promote these services and stimulate demand.

Low education level

- Provide educational messages through alternative channels.
- Provide help in negotiating with health services, especially at large, unfamiliar institutions (social worker).

More ANMs should be made available at the subcenters level and nurse/midwives at the block level (public or contracted) to provide life saving 24 hours services that is almost one and a half times higher than that for mothers in their twenties. Orientation and training of managers and service providers on gender and equity issues along with identification of economic barriers to women accessing care and exploring options of simple schemes (e.g. demand side financing based on vouchers for poor households, especially women) for their economic development is also required.

Table 8.20: Factors that influence women's access to healthcare

Economy, society & culture	Systemic issues	Mindset and attitudes
• Poverty • Powerlessness • Low Status of women • Poor women preoccupied with survival • Perception of self • Post puberty practices and child marriage • Burden of work • Access to family income • Domestic violence • Preference for sons • The stigma of infertility • Economic dependence	• Physical access • Availability of providers • Dysfunctional facilities • Location and timing • Quality and cost of care • Clinical, communication and managerial skills of providers • Over-medicalised services • Women specific services • Multiple windows for services • Reliable referral services	• Population control mindset • Primary focus on women of reproductive age • Discrimination against minorities and marginalized groups • Attitude of managers and service providers towards the poor, especially women. • Attitudes of providers towards adolescents & women out of wedlock • Absence of a rights perspective.

HEALTH EQUITY

Extensive health inequity in India persists. Evidence from various national sample surveys unquestionably finds unequal health outcomes and access to services according to social identity, socioeconomic status, and geographical location. Some of the facts:

- Almost half of children (47%) under three years of age are underweight, a measure of short and long term undernutrition.
- Children from scheduled tribes are the more likely to be undernourished.
- Children born to illiterate mothers are more than twice as likely to be underweight or stunted as children born to mothers who have completed at least high school.
- Early marriage of women keeps fertility high and increases the probability of high-risk births. 19% of total fertility is contributed by very young mothers (age 15-19). Children of very young mothers have an infant mortality rate that is almost one and a half times higher than that for mothers in their twenties.
- 52% of women aged 15-49 and 74% of children aged 6-35 months are anaemic. Among both women and children the risk of anaemia is higher with lower level of woman's education, poorer economic condition of the household, rural residence, and SCs/STs.
- Boys and girls are equally susceptible to diarrhoea and ARI, but boys are more likely than girls to be taken for treatment to a health provider.
- Older women, rural women, and more socially and economically disadvantaged women are less likely than others to deliver in institutions or to have a health professional present at the time of delivery.
- In the first month of life, the risk of dying is higher for males than for females, but after the first month of life, when factors other than biological ones begin to dominate, female children face an increasingly greater risk of dying than male children. The risk of dying between ages one and five years is 47% higher for females than for males.

At the aggregate level, children from scheduled tribes, scheduled caste and poor households have the highest risk of neonatal, infant and child mortality table 8.16. Maternal mortality estimates produced using the sisterhood method suggest women from scheduled tribe and scheduled caste groups had higher maternal mortality ratios than other women.

The Causes of Health Inequity and Vulnerability

- Tribe, caste, poverty, region and religion, all exercise a powerful influence over mortality and morbidity rates.
- Environmental Factors: Inadequate water and sanitation, indoor air pollution, crowding, poor housing conditions, and high exposure to disease vectors.
- Undernourishment and essential micronutrients deficiency.
- Inequities in coverage of preventive intervention.

Demand-Side Barriers to Accessing Services

Several barriers (financial, social, cultural and informational) have been identified that discourage the poor from using public health facilities, causing them to turn to the private sector and incur avoidable costs, engage in self treatment, or simply bear with ill-health if they cannot pay even the "nominal" fee at public facilities.

- "user charges" should accompany with provision of medicines, critical services like STD treatment and emergency services for poor.
- For poor there is already hidden cost of using public health services such as travel costs, wage loss, cost of consumables and bribes/tips for health staff that make public health services even more unattractive to the poor and marginalized.
- In many urban areas, the cost of institutional delivery is a reason why the poor prefer home deliveries, especially for higher order parities.
- The opportunity costs of inconvenient timings and long waiting times at public facilities pose significant additional barriers to low-income users who lack flexibility in their work hours. Seeking care in private clinics is quicker, easier and more convenient.
- The absence of female doctors in many PHCs, is a major deterrent to women and adolescent girls resulting in delayed care seeking and increased informal health care seeking.
- The system of referral to higher health facilities is yet another deterrent in availing public services as users prefer a "one window service" that will reduce their time and travel costs.
- Lack of regard for their privacy and dignity, use

of abusive language, harsh and often violent handling of patients, particularly women admitted for delivery, and an unsympathetic approach pose significant constraints of users further discourage them from availing services.

Health Expenditure

Nationwide data shows that the poor form the greatest proportion of the private sector providers' workload. Out-of pocket expenditure on health is by far the main financier of health care in India across all socioeconomic groups, and trends in health seeking behavior since the mid-80s suggest an increasing squeezing out of the poor from accessing health care and worsening class inequality. Current public health financing is benefiting the better-off people significantly more than the poor. The poor get benefit more from primary and preventive interventions and the better-off from secondary and tertiary hospital care.

It has been observed that the target populations that need to be addressed in pursuit of health equity outcomes are extremely diverse. They are both spread across India (women, adolescents, elderly, scheduled castes), and concentrated in geographical areas (EAG states, scheduled tribes, urban poor, migrant workers). Under the RCH program these issues are taken into account while setting the objective.

Objective

- To reduce the health inequities both between geographical areas and between social groups, and to respond to the needs of vulnerable populations

Indicators of Equity

Equity data from NFHS-2, NFHS -3 and the RCH Random Household Survey (RCH RHS) has been used to set a national equity baseline using a mix of health outcome and health service use indicators. This short-term use of existing databases will need to be improved upon to produce a more robust baseline and set of indicators in the future. Following are the indicators:

1. Reduction in the disparity between various groups such as lower socioeconomic groups, scheduled castes, scheduled tribes in relation to the Neonatal Mortality Rates.
2. Reduction in the disparity between lower socioeconomic groups, scheduled castes, scheduled tribes in relation to the Infant Mortality Rates.
3. Reduction in the disparity between lower socioeconomic groups, scheduled castes, scheduled tribes in relation to the Under 5 Mortality Rates separately for boy and girls.
4. Reduction in the disparity between lower socioeconomic groups, scheduled castes, scheduled tribes in relation to the ANC including TT injection received during pregnancy, care received during child birth and attended by Trained Birth Attendant, Maternal Mortality Rates, reduction in anemia particularly during age group of 15-19 years, etc.
5. Reduction in the differences between the above key health indicators in the Empowered Action Group (EAG) states.
6. Disparity Reduction between the health outcomes of the urban poor and the urban non-poor.

Empowered Action Group

The EAG is currently located within the MoH&FW. As such it has all the advantages and disadvantages of any unit within the government. It has authority at the highest level to approve funds with minimum delay. The challenges in the EAG states, however, require a well-resourced support mechanism that can create and maintain the momentum of RCH II.

Area projects which were funded by world bank are absorbed in RCH-II. This division is also handling the components of "Vulnerable Group RCH" under the RCH-II program. This vulnerable group comprise of urban slum population, tribal population and general vulnerable groups and poor people, living outside urban slums and notified tribal areas.

Equity Monitoring

Concurrent equity monitoring at state and district level through the RCH Random Household Survey provides evidence of equity trends. In the medium term (2006-7), planned household surveys designed to produce more robust and disaggregated equity indicators that can track changes in the behaviors and social and cultural determinants that have impact on health outcomes.

State is encouraged to set out in their PIPs and logframes, plans to develop a quarterly updatable website on inputs and resources provided for RCH services, including financial, human, and material resources

(including medicines and equipment). Public disclosure of information practices inform and enable the public to monitor service standards and hold providers, managers and policy-makers to account for deficiencies.

Accountability and voice

Accountability is weak in the public and private health sector. The overly bureaucratic nature of the health system and the lack of local authority and flexibility lends itself to the situation where staff and management are shielded from accounting for poor performance of health outcomes and outputs. Citizen voice initiatives in the health sector are growing but not well connected. The right to information bill has now created space for civil society to make stronger claims, and there are examples of how access to information is enabling citizens to challenge use of Government resources.

Public Expenditure

Health care in India is predominantly financed by out-of-pocket spending. This is generally recognized as an inequitable and inefficient way of funding health care as it requires people to find funds when they are least able to (when they are sick) and ensures that health care is provided according to ability to pay and not according to need. This pattern is repeated for reproductive and child health where the few available studies suggest that out of pocket payment is the main funding source. Few people can afford to meet the costs of treatment – especially where it requires hospitalization – from their current income. Instead, they must resort to use of savings, borrowing or sale of assets, which is likely to cause or worsen poverty.

There is little evidence of greater commitment to expenditure on family welfare over the last 10 years. At the state level the share of health in the 15 major states declined from 5.2% to 4.6% of overall state public spending between 1991/92 and 2000/01. Family Welfare spending declined from 0.92% of total expenditure to 0.72% over the period. Health spending, as a whole, fell from 1.10% of NSDP in 1990/91 to 1.05% by 2000/01 and family welfare from 0.19% of NSDP to 0.17%. Improvements in reproductive health outcomes require multisectoral action. There is a strong economic rationale for supporting RCH interventions. They are highly cost effective if delivered efficiently. They address to market failures (due to externalities) and also equity concerns (as the burden is greatest on the poor).

STIMULATING DEMAND

The provision of services does not guarantee demand for them. There are various constraints:

Barriers to demand

Household and community

1. Gender and equity barriers.
2. Poor Knowledge and behavior.
3. Lack of community participation.
4. Poor geographical accessibility.
5. Inadequate mobilization of health care resources.
6. High cost.

Program level

1. Weak decentralized management.
2. Poor governance and lack of accountability.
3. Provider's attitudes.
4. Perceptions of poor quality.

Policy Constraints

1. Lack of appropriate policies and legal framework.
2. Cross-sectoral issues; other sectors influence demand, for example, education, access to water and sanitation.

Strategies to stimulate demand

1. Addressing the gender and equity barriers to access.
2. Stimulating demand and access through participatory approaches to RCH II service planning and delivery through interventions such as:
   - Involving community groups.
   - Providing outreach services with community participation.
   - Peer motivators are effective in providing RCH counselling and services.
   - Women's groups can raise awareness of RCH needs and rights and to mobilize and strengthen the capacity of women to utilize services.
   - Participatory monitoring tools such as the home-based maternal record.
   - Involving men in acceptance of RCH services.
3. Reducing the cost of care in the public sector and protecting the poor from the financial consequences of Illness.

4. Public Private Partnerships (PPPs) to increase service coverage.
5. Targeting services appropriately can substantially increase demand
6. Introducing strong monitoring mechanisms
7. Enhancing provider accountability by developing a "results framework" for which providers are accountable.
8. Quality assurance (QA) programs
9. Community monitoring
10. Operational Research
11. Training health workers in short course anaesthesia, EmOC and extending the roles of ANMs and grassroot workers.

INTERSECTORAL AND DONOR CONVERGENCE

Intersectoral coordination, especially between the Departments of Health, Department of ISM&H, Women and Child Development, Human Resource Development, Education, Rural development, Urban Development, Labor, Railways, Industry and Agriculture is critical for increasing the coverage of the Family Welfare Program thereby improving to implementation (Planning Commission). Some of the areas where inter sectoral coordination is envisaged, include:

- Education Department in BCC messages on reproductive and child health care, female literacy and employment, raising the age at marriage, generating more income in rural areas, improving the nutritional status of women and children.
- Coordination among village-level functionaries such as Anganwadi workers, TBAs, *Mahila Swastya Sangh*, *Krishi Vigyan Kendra* volunteers and school teachers to achieve optimal utilization of available resources.
- Blood safety: making safe blood available at all appropriate facilities.
- Management of RTI/STI through specialized and improved service delivery at public health facilities, training doctors and the provision of drugs to treat RTI/STIs.
- Prevention of Parent to Child Transmission (PPTCT) has a key linkage with pregnant women.
- Weighing each child monthly, including neonates, recording the weight on the growth card, using referral card to send mothers and children to the Sub-center or PHC, maintaining child cards for children below six years and discussing these with visiting medical and para-medical staff.
- Carrying out quick sample census of all the families, especially pregnant women, mothers and children in those families in their area.
- Providing health and nutrition education to mothers including home based care for new born babies.
- Visiting homes to educate parents to improve their child's growth and development particularly for children attending the anganwadies.
- Assisting ANMs and PHC staff in the Health component of the RCH II (e.g. immunisation, health and antenatal checkup, safe delivery).
- Becoming depot holders for contraceptives, ORS, Vitamin A, delivery kits.
- Maintaining records of the immunisation status of children and pregnant women, in her area.
- Supporting ANMs in preparing Annual Plans under the Community Needs Assessment Approach.
- Acting as a focal point in the village for Maternal and Child Health.
- Maternity Huts to be built at Sub-Center under the Rural Housing Scheme.
- Connectivity to Rural Primary Health Infrastructure to be adopted as criteria for schemes under Prime Minister Gram Sadak Yojana.
- BCC assistance at block level for water purification.
- Development of training modules for members of Panchayati Raj Institutions, identification of Training Institutions and trainers etc.
- Dissemination of information about the schemes and initiatives of Department of Family Welfare through newsletters of both Departments.
- A joint working group of Ministry of HRD and MoHFW to come up with a composite educational drive, which will combine the aspects of raising the literacy levels of girl and girl child and imparting the awareness of the Family Welfare Programs in the educational curricula.
- Utilizing Nehru Yuva Kendra for imparting family life education to out-of-school adolescents, especially in EAG States.
- Family life modules to be used as primers for adult literacy program
- Introduction of family life module in NCERT syllabus for 10+2 classes.

- Stories on small family, early marriage, son preference etc. to be incorporated in school syllabi.

An institutional mechanism is established that meet regularly to stimulate, steer and monitor the process of convergence. There are :

- A Convergence Policy Group
- A Convergence Working Group

The Convergence Policy Group

This group recommends the policy framework for the working group. The Secretary Planning Commission may chair the Policy Group and its members may include Secretaries from the following departments:

- Family Welfare (also designated the Convener).
- Health
- Woman and Child development.
- Rural Development.
- Urban Development.
- North East Development.
- Elementary Education.
- Literacy.
- Youth affairs and Sports.

The Convergence Working Group

This group meets once a quarter for half a day at a venue selected exclusively for this purpose. The meetings of this group may be co-chaired by the Secretaries of Health and Family Welfare. Joint secretaries of the related ministries of RD, UD, WCD, North East Development, Department of Elementary Education, Literacy, Youth Affairs and Sports as well as the Project Director NACO may form the rest of the Working group.

BEHAVIOR CHANGE COMMUNICATION

Studeis revealed that traditional IEC methods have stopped giving information and creating awareness but BCC is characterized by its *direct approach towards changing behavior.* This means that there is an acknowledgment that simply giving information and raising awareness of a health issue, is not sufficient. Direct messages that relate to the identified desired behaviors must be given, and in a variety of ways.
Two principles are paramount:

- Behaviors must be adoptable in the context of peoples' lives.
- Behaviors must be amenable to change.

BCC must be:

- Research based,
- Client centered,
- Benefit oriented,
- Service linked,
- Professionally developed, and
- Linked to behavior change.

Stages of Behavior Change

Stages of behavior changes are explained by several theories and models that have tried to understand the process of adoption of more healthful behaviors. One model which was developed and tested by Prochaska and Diclemente (1983) applies primarily to long term lifestyle changes. The model stages are as follows:
Pre-contemplation: this is the stage at which individuals are not even considering the idea of a change. Unfortunately some persons always remain at this stage.
Contemplation: at this stage, people begin to think actively both about the health risk and the actions required to reduce that risk. The issue is now on their agenda, but to action is planned.
Preparation: At this stage, contemplation moves into early action, such as developing a plan, joining a self help group, collecting health information etc.
Action: This stage is marked by observable changes in the health related behavior itself. The battle is under way. There may be relapses, but these should be dealt with as part of the change process and not as an excuse to slide back into contemplation. The action stage may go on for about six months. If successful, the person, or group, moves on to the less intense maintenance stage.
Maintenance: At this stage the new health action needs to be firmly consolidated as a permanent lifestyle. Prevention of relapse to the less healthy behavior is essential. A return to smoking, alcohol abuse, sedentary habits, or failing to complete a series of immunizations, may erase all the progress from earlier stages. Confidence and self efficacy increase. Temptations to relapse are dealt with more routinely.
Branding means much more than just having a logo; it should ensure that all parts of the Program are uni-

fied. "Reproductive and Child Health" says little, if anything, to the general population. A brand should relate to what is being offered to the consumer and provide a promise. It must be seen and heard in BCC materials, the uniforms of workers, the equipment and vehicles, on banners and wall paintings.

Constant media pressure is a feature of successful public and private programs. A limited number of BCC messages must be presented regularly and in different ways so that the audience becomes familiar with the issues and begins to internalize them.

Multiple influences and influencers are needed to make BCC strategies effective. For example, mothers-in-law are known to influence the birth spacing behavior of newly married couples. She will also play a significant role in pregnancy, delivery and infant nutrition, perhaps discouraging immediate and exclusive breastfeeding. So, they will be an important target group for BCC for young mothers.

Combining professional skills with contextual understanding will enhance the chances of success.

Understanding that changing behavior takes time but well designed program would take a lesser time. Communication alone cannot bring about change when behavior fulfillment depends on service delivery, but a BCC strategy can be formulated such that behavioral antecedents are clearly established and targeted; from awareness and knowledge to positive attitudes, expression of intention and the final behavior. In formulating behavior change communication for these three areas, therefore, it has been attempted to identify some antecedents that a communication strategy could target.

Indicative behaviors for change

- Encouraging men, women and health workers to recognize and reduce gender and other barriers to equity of access.
- Encouraging institutional delivery/delivery by skilled attendant (not TBAs).
- Alerting women and men about danger signs during pregnancy, delivery and the postpartum period: about what to do, what should they expect from a EmOC center and how to lobby for one.
- Encouraging birth spacing, increased age of marriage.
- Encouraging immediate and exclusive breastfeeding, care of the normal newborn, neonatal danger signs and what to do about them.
- Encouraging acceptance of immunization.
- Alerting men, women and family members about how to recognize and manage ARI and diarrhoea.

Priority markets and target groups

Geographical characteristics

- The first priority will be the EAG states and the recently formed states.
- A second geographical priority will be the seven small northeastern states and Assam.
- Cities will be targeted in the BCC strategy, based on geography (EAG and northeastern states), size of slum populations and the existence of RCH services for slum dwellers.

Six distinct targets groups

- Service providers in the public and the private sector
- Panchayat, religious and other village leaders
- Adolescents
- Couples with one or more children
- Couples wishing to have no more children
- Mothers-in-law

Secondary target groups differ from the primary ones described earlier in their proximity to the behavior that is being targeted or their social influence over those whose behavior is being targeted. They include:

- Functionaries in related departments.
- District and block administrators.
- Media and film producers.
- Private sector employers.

Management

BCC will be managed as a centrally developed and directed strategy, based on extensive research and state participation, with key partnerships with the private sector and NGOs. A new BCC unit for the RCH II, staffed by professionally skilled and experienced personnel (contracted if necessary) will be located in the IEC Division of MoHFW responsible for developing, implementing and monitoring the communication strategy for RCH II. The BCC unit be constituted with eight new members of staff:

- Strategy development (1 person)

- Media planning and operations (1 person)
- Research & Analysis (1 person)
- Field operations ~ non-mass media activities (4 persons)
- Internal communication management and logistics (1 person)

Monitoring & Education
Inputs, processes, immediate behavioral outputs and the impact of the BCC strategy will all be monitored to ensure accurate understanding and diagnosis of results.

Documentation: Effects of BCC programs must be properly documented. It is desirable to conduct a baseline survey before commencing a BCC program. After the said BCC program is terminated the results of its evaluation must be properly documented as case studies for future planning, erecuting & monitoring of BCC programs.

Impact data, such as IMR and TFR, will provide a composite measure of communication and service delivery strategies. Only where service delivery has not changed, the impact will be attributable to communication, but if the antecedents have been monitored, they will provide insights into the causes of impact.

COMMUNITY PARTICIPATION

Community participation refers to procedures whereby members of a community participate directly in decision making about development that affects the community. Government of India recognizes the need to involve communities, their elected representatives and the civil societies in planning and monitoring of RCH services and in making them partners in delivering and monitoring of the quality of care being offered. It is also recognized that individuals and families need to move towards adopting healthy lifestyles and living in healthy environments to keep themselves and their children healthy.

There are following constraints to greater and more effective participation:
- Poor health worker appreciation of the value of participation;
- Poor health worker skills in facilitating community involvement;
- Lack of accountability for the services being provided;
- Weak political commitment towards community involvement; and
- Lack of structures for communities and health services to plan jointly.

Health workers may use their knowledge or skills to override community inputs. Genuine participation needs to find structures, processes and tools that enable different forms of authority to interact productively. Policy guidelines on participation should be clear and available to the public to facilitate their role.

PUBLIC PRIVATE PARTNERSHIPS (PPP)

Private health care is by far the preferred source of all socioeconomic groups in India, and out of pocket expenditure the main source of health financing. Government perceived that political enthusiasm for PPP is growing and there is an urgency to put in place the policy frameworks, regulation and safeguards to ensure that PPPs benefit all social classes and not just the better-off. A concerted effort will be taken to ensure that PPPs do not exacerbate the health inequities in India, by promoting and protecting the interests of the more vulnerable. The need for PPP is highlighted by 10th Five Year Plan, National Health Policy 2002 and also National Population Policy and more elaborated in 11th plan draft document.

The Policy also proposes to encourage NGOs to provide advocacy, counselling and clinical services; promoting private health facilities in under served areas, along with a set of clearly defined incentives, ensuring service delivery; involving the private sector in local level collaborative arrangements; and promoting NGO initiatives in the community care of the elderly and community mental health services.

Three key types of PPPs will be strengthened in RCH II:
- The current national social marketing program will be expanded and diversified and new social

franchising initiatives will be developed.

- Current contracting-in approaches (of both health and non-health professionals) will be developed and expanded.
- Current contracting-out approaches (for clinical services, non-clinical services, BCC, management and ancillary functions) will be further developed and expanded.

Two new approaches to PPPs will be introduced in RCH II in order to:

- Improve the quality and equity of access to private sector RCH services.
- Ensure affordable and equitable access to quality pharmaceuticals and diagnostic testing services.

Social Marketing and Social Franchising: The current social marketing (SM) approaches will be developed so that the range of products to be socially marketed are expanded; market reach is extended especially to rural areas and variable marketing and promotional subsidies, appropriate to different market segments, are introduced. Experiment on Social Franchising has been carried out and in RCH-II there will be more involvement of practitioners in rural areas to provide reproductive services as a package.

Contracting In: Training of doctors and staff in anesthesia and minor family planning operations or referring public patients to facilities where such specialists are more regularly available.

Contracting out: Contracting NGOs, private sector to provide family planning and other RCH services; for outreach and mobilization services; for BCC activities; for maintenance, security, facility cleaning, and transport; program management expertise through Program Management Units (PMUs) and support functions (e.g. specialist training).

Enhancing the quality of RCH services in the private sector: Quality will improve through Continuing Medical Education (CME) and Continuing Professional Education (CPE); developing guidelines and protocols; setting standards to ensure quality of services; Accreditation; Regulation; Strengthened redress procedures through such as the Consumer Protection Act.

Equitable access to medicines: Equitable access can be ensured by improving the rational use of drugs (through CME, CPE, guidelines and protocols); BCC; Bulk purchasing; and Social franchising.

RCH Planning: ***Marginal Budgeting for Bottlenecks*** **(MBB)**: The many and diverse planning processes designed for RCH II brought the obvious challenge of linking and integrating them effectively. The MBB approach is still being developed, although initial work is promising. The proposed revision of the MOHFW budget structure will offer valuable opportunities for ensuring that the requisite budget heads are available in future for the effective financing and financial monitoring of PPP initiatives.

Partnership with Non Governmental Organizations (NGOs) & Private Sectors

Several voluntary organizations are working in the field of population and reproductive health (For more details please see chapter on Organizations). The role of these organizations outside the government is complementary in nature and not an alternative to work through a government system. The NGOs have the advantage of flexibility in procedures, can develop rapport with the local populations and also enjoy credibility with local people. Under the RCH Program, NGOs are assisted at various levels:

Small NGOs: At the village, Panchayat and block level, small NGOs are being involved for advocating RCH and family welfare practices and general counseling. At the same time, individual NGOs are also being encouraged to propose innovative Programs. Small NGOs with limited resources are being assisted through mother NGOs.

Mother NGOs: The objectives of the MNGOs scheme, are to improve RCH indicators in the under served and unserved areas, with specific focus on MCH, FP, immunization, institutional delivery, RTI/STI, adolescent reproductive health care including gender concerns and male involvement.

NGOs with substantial resources and proven competence are being selected as mother NGOs. Each MNGOs has to work with only 3-4 field NGOs from each district, encouraging each MNGO to identify the underserved and un-served pockets within the district in consultation with district health officials. So far 306 mother NGOs are working in 414 districts which have been identified to screen, select, guide and monitor the work of smaller NGOs called *field NGOs* in specified districts. Some of them at national level are

entrusted with the job of pre-appraisal, appraisal and evaluation work of other NGOs. Independent evaluation of mother NGOs is being proposed.

Service NGOs: These are those who are expected to provide clinical services and other specialized aspects such as dai training, MTP, male involvement, covering 100,000 population contributing to achieving the RCH objectives. NGOs with established institutional and infrastructure for service delivery are encouraged to compliment the public health care delivery system in RCH-II program. These SNGOs will cover an area co-terminus to that of a CHC/block PHC with approximately 100,000 population or around 100 villages. Service NGOs are expected to provide a range of clinical and non-clinical services directly to the community as an integral package of RCH-II services such as abortion, safe deliveries, treatment of RTI/ STI, neonatal care, treatment of diarrhea and ARI. The SNGOs must have appropriate staff infrastructure such as clinic/hospital, and ambulance.

State NGOs: The State NGO Committee will be responsible for MNGO selection, recommendation of projects for GOI approval, fund disbursement, capacity building, monitoring and evaluation. The District RCH society is responsible for all the operational aspects of the program management at the district level. The district NGO committee holds the responsibility for recommendation of MNGO composite proposals to state RCH society, facilitate the signing of MOU with the MNGO and pass it on for fund release to state RCH society and under take review meetings and periodic monitoring in the field for assessing FNGO/ MNGO.

State NGO coordinators are responsible for monitoring the implementation, facilitating timely submission of NGO reports to the state government, providing government feedback to NGOs, communicating government policies and programs, and facilitating NGO dialogue with the district health system.

The Apex Resource Cell (ARC), Regional Resource Centers (RRC) and the best practice centers provide the mechanism for support. Some of the regional resource centers are- Child in Need Institute Kolkata, Family Planning Association of India Mumbai, Gandhigram Institute of Rural health and Family Welfare Trust Dindigul TN, Voluntary Health Association of India New Delhi, Center for Health, Education, Training and Nutrition Awareness Ahmedabad, Mamta Health Institution for Mother and Child New Delhi, Population foundation of India New Delhi, and Hindustan Latex Family Planning Promotion Trust, Thiruvananthapuram.

The organized sector: The industry has always taken a lot of interest in the Family Welfare Program. For example, Tata companies vigorously promote the Program among employees as well as in the neighborhood of its factories. Many companies provide for educational allowance to children of small families. NGOs and private sectors are involved in following areas:

1. Monitoring,
2. Implementation of Program,
3. Training of dais, ANM, etc.,
4. Information Education Communication,
5. Mobility of essential obstetrics care,
6. Audit of services delivery,
7. Management support to institutions at state and national level, and
8. Organizing community polls.

Under the RCH program, safe motherhood consultants and private anesthetists can be contracted for services and public health care facilities. Trained doctors can be hired as Safe motherhood consultants for safe abortion services once a week/fortnight at PHC during the visit. They can also take care of antenatal and postnatal patients. They are paid @ Rs. 800 per visit. A private anesthetist can be hired during emergency obstetric care @ Rs. 1000 per case. Due to shortage of specialist, short term training is being organized for MBBS doctors for this work. Modalities are planned for involvement of doctors of Indian system of medicine, ANM, PHN, Lab technicians, on contractual basis to provide services. Similarly discussions are on with CII and FICCI for involvement of industries in RCH work.

Chiranjeevi Yojana

For reduction of MMR Government of Gujarat initiated an scheme in public private partnership (PPP). This scheme was called "Chiranjeevi Yojana" – a local name meaning "Eternal life" (of mothers and babies) to provide delivery care to the poor & underprivileged

in rural areas. Implementation of Chiranjeevi Yojana6: In 2005, Gujarat government, in collaboration with academic institutions Indian Institute of Manage-ment, Ahmedabad (IIMA), Sewa Rural, Jhagadia (NGO) and GTZ (Infosys company) implemented this scheme.

The government GR on Chiranjeevi Yojana: The committee of various stakeholders was formed to decide on the empanelment of the Nursing homes / Gynecologist for enrollment in the scheme as per the checklist. Enrolled obstetricians have to provide deliveries under CY free of cost in their own hospital which included medi-cines, laboratory investigations, drugs, operation charges, operative materials and anesthesia. A detailed package of 100 deliveries was formulated with inclusion of indirect cost of transportation charge Rs 200 which has to be given by Obstetrician.

The package of 100 deliveries for private practitioners who provide services at his/her nursing homes was initially Rs.1,69,500 and later it was raised to Rs. 3,80,000. If a private practitioner provides his services at government setup, the package cost is Rs 86, 500 which was raised to Rs 2,50,100 per 100 deliveries. 6 Beneficiaries were BPL families and Schedule caste (SC) and Sched-ule Tribe (ST) families. Now due to newer policy changes only BPL and ST families are the only beneficiaries.

Women not having BPL card can also avail benefit of the scheme provided her pregnancy is registered at the Anganwadi with satisfactory cross-verification by health workers and the medical officer of the UHC. The pregnant women must also visit at least 3 times to the urban health center for routine ANC. It was found that the awareness about the yojana is poor and variation of its utilization in different part of the state is different. Strict monitoring of nursing homes is required for better quality of services (Mehariya VK et al 2015).

Till 2012, the program had paid over $32 million to designated private-sector hospitals to provide free-of-charge delivery services to poor women. Although some studies had reported substantial benefi ts from the scheme, a recent systematic evaluation of the program has found little or no association between the *Chiranjeevi Yojana* and reduced out-of-pocket costs of deliveries for the benefi ciaries (Mohanan M et al. 2014).

INFRASTRUCTURE

Under the NRHM all level of health infrastructure are improving according to Indian Public Health Standards. But such improvement is not uniform throughout the country. In some states it is performing well and in others it is lagging behind. The focus in more on north east states and in those where indicators are poor.

PROCUREMENT AND LOGISTICS

Procurement is defined as the process of acquiring supplies. It may be effected by purchasing the needed drugs from a private or public supplier for an agreed upon price, by donation/contracting agencies such as Unicef or WHO or by arranging manufacture of certain crystalloid and distilled water, etc. within the hospital or health care setting. Procurement is a cyclic process which requires a sequence of steps, the time table which should be clearly specified and closely followed.

1. Review drug selection
2. Determine the quantities needed
3. Reconcile needs and funds
4. Choose procurement method
5. Select supplies
6. Specify contract terms
7. Monitor order status
8. Receive and inspect drugs.

Purchase Process: this is through State Rate Contract, medical store depot, tender system with negotiations or local purchase. While purchasing supplies four factors need to be borne in mind: essentiality, the quantity, the quality, and the cost. Tenders are called for from the suppliers of required items by giving detailed specification of the items, terms and conditions of the purchase, etc. After analyzing the tenders negotiations are held to get the best price, quality, mode of supply and payments etc. Proper selection of the supplier is based on the past performance, credibility, price, and other conditions offered. The rates for the items during the year are generally fixed so that the health care setting or hospitals could purchase these

items at the rate contract price, terms and conditions during the relevant year. Procurement methods: a) Tender buying; b) negotiated procurement; and c) direct procurement.

The proper management of equipment and supplies is essential for the efficiency and effectiveness of RCH clinical and support services. Quality care depends upon the availability of appropriate equipment, materials and services. To ensure efficiency, and to reap scale benefits, there is need to a supply strategy which:

- Addresses supply management arrangements with a view to agree appropriate levels of purchasing activities at State, District and local level.
- Establishes a modern, integrated, cost-effective logistics and supply chain for states.

There is a need to develop RCH II procurement and logistics management system at central and state levels to monitor the requirement of commodities and the logistics to ensure uninterrupted adequate availability. A cell need to be created within the department or outside the ministry for managing both procurement and logistics at all levels.

Materials or logistics or Inventory control is basically a scientific system which indicates as to what to order, when to order, how much to order, how often to order so that the purchase costs and storing costs are kept as low as possible. There are basic techniques of inventory control namely ABC analysis, VED analysis, **SDE** analysis. ABC analysis is based on drugs classification as Group A (10% of drugs that cost 70% of the resources), Group B (20% of drugs consume 20% of resource) and Group C (70% of the drugs consume just 10% of the resource). **VED** is referred to **V**ital and expensive items, **E**ssential but less expensive and **D**esirable and cheap items. SDE is referred to those items which are **S**carce, **D**ifficult to procure and **E**asily available in markets (Kishore 2013).
In order to improve the procurement and logistics the following measures are undertaken by the Ministry of Health and Family Welfare namely:

- Ensure 0% stock out at the district level. The annual requirements for subcenters/PHC/CHC/ FRU are sent to the districts once every year. Stock outs occur due to the delay in supplies.
- The proportion of facilities reporting receipt of supplies on time would be increased to 90% by having a fixed period of supply during each year namely February-March.
- The stocks are normally sent for one year and the norms for allocation have been arrived at after several rounds of deliberations.
- The reduction in drug loss due to expiry to 5% of the overall stock turnover. The drugs are sent to the districts with $5/6^{th}$ of the shelf life and most of the drugs have shelf life of 2 to 3 years. The end user needs to ensure the utilization of the drugs within the shelf life.
- Immediate attention will be given to equipping 90% of CHC/PHC with appropriate storage facilities and better inventory management practices. Appropriate hardware, software and human resources would be ensured.
- Decentralization of procurement of high-value items and decreasing procured by the Central Procurement Division of the ministry.
- Procurement plans will be developed for all major procurements at least six months in advance.
- The system to periodically update the essential drug list is developed.

STRENGTHENING OF TEACHING INSTITUTIONS

With the aim to improve the infrastructure of 100 government-run teaching institutions to enable them to contribute to the RCH II program more effectively following objectives have been made:

- Strengthen facilities at teaching institutions for providing optimum obstetric, family planning, neonatal and child health services.
- Strengthen capacity of teaching institutions for imparting pre- and in-service education and training to providers in reproductive and child health; and for operational research.

This initiative is to supplement the resources available to the government sector, teaching institutions to improve obstetric, family planning, neonatal and child health services, and to strengthen the training/education capability of the departments of Obstetric & Gynecology and Pediatrics.

Human Resources

The appropriate development of human resources will be an enormous task, as it must encompass:

- The strategic RCH II imperative of serving difficult to reach groups.
- Changing attitudes and behaviors.
- Changing demands from users.
- Rapid advances in technological knowledge.
- New approaches, systems, tools, ways of monitoring.
- New partnerships and contractual arrangements.
- State-specific planning.

A critical problem facing RCH II is the uneven urban/ rural distribution of staff. Reluctance on the part of health workers to work in remote rural areas results in vacant posts, long leave of absence from work and political pressure for transfer.

Deployment of staff in sensitive areas within districts so that staff are better matched to serve the social and religious characteristics of the local population hasve enhanced acceptability and helped to overcome some of the access barriers of vulnerable groups. Frontline staff is better supported to cope with the emotional and personal stresses they encounter in their work, such as violence against women, child abuse and social discrimination.

Many of the services can be contracted out to local practitioners, specialists and traditional system of medicine, etc. A system of incentives to encourage health personnel to take up less popular posts will be explored. Such a system might include:

- Decentralized recruitment and selection policies that bring local or locally trained personnel into the system with greater stability and ownership.
- Better residential and recreational facilities for the staff.
- Generous education allowances.
- Prioritizing difficult districts for development, in particular for education and rural infrastructure.
- Salary and further training incentives.
- Clear opportunities for career advancements.

Capacity building is an important part in RCH II which include in-service and pre-service training.

The RCH II training strategy addressed: Staff appraisal, Promotion, Career development, and Placement.

HEALTH MANAGEMENT INFORMATION SYSTEM, MONITORING AND EVALUATION

A health management information system (HMIS) is a process whereby health data (input) are recorded, stored, retrieved and processed for decision-making (output). Decision making broadly includes managerial aspects such as planning, organizing and control of health care facilities at the national, state and institution levels (Chawla et al 1997). In public health programmes HMIS would be primarily concerned with health care delivery issues like - antenatal care, immunization, and disease control programs and administrative issues like reporting, inventory management, financial management, and vehicle and personnel management issues. Therefore maintaining a good HMIS is an essential part of running a health system. This can be done manually as it is being done in most of India, or it can be maintained in a computerized system.

A comprehensive, integrated Health Management Information System (HMIS), spanning all levels of a health service is now regarded as a key component of a modern health system; integral to the effective and efficient management and coordination of resources. RCH II, a sub-sector program of combined centrally funded elements will generate an abundance of information that must be accessed and used to support central, state and district management decisions.
The clear common thread is for quality information to drive and support processes in the management of resources, and for the staff involved to be aware of the need for appropriate and timely information, and to understand how to use it effectively.

The main problem with the current health information system is that while health workers are required to maintain a large number of registers, the data generated are rarely used as the basis for management decisions. This leads to grassroot workers not maintaining their registers properly and complaining that too much of their time is spent in record keeping. A new system is planned for collection of data through Community Need Assessment Approach that limits problems experienced during CNA implementation in RCH-I. The entire CNAA system will be reexamined. The

process of CNAA as a tool for preparing action plans through a participatory approach will be reemphasized and the capacity to use CNAA to plan and monitor will be strengthened.

Community Need Assessment and Monitoring Approach (CNAMA)

The role of male health worker in CNAA is broadened and clarified. CNAA is renamed the ***Community Need Assessment and Monitoring Approach*** (CNAMA) to emphasize monitoring in the approach.

The forms will be redesigned so that they require data only on those indicators that will be used to monitor the program at the next administrative level and will focus more on collecting data on process rather than outcome indicators, as the information collected through the routine HMIS on the latter is likely to be more reliable than on the former. Data on outcome indicators will be collected through population-based RCH surveys and other sources on vital statistics. RCH II staff and statistical officers at all levels will receive comprehensive training on how to use HMIS data in planning. RCH II managers will conduct regular review meetings to discuss and plan activities based on the HMIS data.

A mid-RCH II survey planed to conduct at state level, linked to the planned NFHS-3 in 2006. These surveys collected data on all outcome and equity indicators related to RCH II. New communication technologies are now available which make it possible for peripheral health workers to access central data through by phone and submit reports electronically, making it possible for a district computer to maintain data for all PHCs/subcenters.

Abolition of Contraceptive Targets

The target free approach was experimented in one district each in 18 states, including pilot projects in Kerala and Tamil Nadu, in the year 1995-1996. Subsequently all the states in the country were made target free. This approach is being evaluated and realized that the term "Target Free" give wrong impression in the minds of workers. To avoid this, from 1997 onward instead of "target free" a Community Need Assessment (CNA) Approach has been accepted. In RCH-I many lacunae were found in implementation of CNA approach.

Action Plan for Community Need Assessment and Monitoring

It is based on the need of community and availability/capacity of health infrastructure under which each subcenter, PHC, CHCs/FRUs, district and state would prepare an Action Plan. Under the CNAA, the work plans for a particular year are to originate from the sub center level under each PHC and are to be subsequently aggregated, with appropriate additions at CHC and district levels. Based on the district action plans, aggregated state action plans are prepared at the state headquarters by making appropriate additions. The formulation of district action plans for a particular year at each level is to be based on the previous year's achievements and projections plus the community needs assessed for the year, on the guidelines stipulated by the CNAA manual. A similar reporting system was also conceived of for the flow of monthly progress reports, except that from each district the forms are to be sent to Government of India along with a copy to the state through NICNET mechanism.

For preparing the action plan under CNAMA the requirement for the coming year would be 5-10% higher than the achievement in previous year. Requirement for MCH services examples, ANC visits, TT doses, I&FA tablets administration can be estimated by:

- Probable number of pregnancies=Population of area X Birth rate of the area.
- Antenatal registration = Probable number of pregnancies + 10% (for Pregnancy wastage).
- 15% of the antenatal women registered are high risk.
- 50% of the registered antenatal mothers are anemic.
- 10% of the live birth babies are sick or high risk and need referral.
- Infants alive at one year in the area= number of live birth – infant mortality rate of the area.
- 8% of the total population is children below 3 years of age.
- 13% of the total population is children below 5 years of age.
- 22% of the total population is women in the age group of 15-45 years.

Indicators

The subcenter Action Plan has following indicators both for previous year and for the planned performance in current years. These indicators will assess the ac-

cessibility, quality and input of the Program:

- Infant Mortality Rate (IMR), Maternal Mortality Rate (MMR), Crude Birth Rate (CBR);
- Prevalence of HIV/STD;
- Female literacy;
- Percentage of Schedule Caste / Slums availing the services;
- Number of urban family welfare centers, health posts and postpartum centers;
- Total ANC registrations, TT doses given, and anemic patients;
- Total deliveries are conducted in the Institutions/ at home attended by the ANMs/LHVs/TBAs/ Doctors;
- Number of women referred for Medical Termination of Pregnancy (MTP);
- Number of RTIs/STIs cases detected and referred;
- Number of children immunized with all the prescribed vaccines;
- Number of children given iron & folic acid tab.;
- Number of ARI cases of children;
- Number of diarrhea cases; and
- Number of eligible couples who have accepted permanent and temporary contraceptive methods with one child, two children and three or more children.

Health workers generate lot of data in the village, send it to the PHC, where it is compiled in the form of monthly reports and transferred to the secondary level.

Primarily the flow of data is unidirectional. In addition, a lot of data that the health workers collect is redundant or never utilized adequately. Efficient management of data is difficult in a manual system, and often involves duplication of efforts and wastage of time. A computerized management information system is one among the many ways that Information Technology (IT) can help improve the health system; IT can aid the workers in providing services, data collection, storage, analysis and dissemination of information.

There have been very few examples globally where a computerized HMIS has been operational in a population based health care delivery system for a significant duration. In evaluation of a Health Management information system in Uganda, based on interviews with doctors and nurses, the authors concluded that introduction of HMIS resulted in health workers valuing the data generated by them better; it supported program planning and decision making as well as improved the quality of and access to health care. Many of the evaluations have also looked at the utility of HMIS as a tool to assist organizational development and found useful (Gladwin et al 2003, Smith et al 2008, Krishnan et al 2010). Computerization of Health Information System should be considered for all the PHCs and CHCs.

Mother and Child Tracking System

The Mother and Child Tracking System (MCTS) is a centralized web-based application launched by the Ministry of Health and Family Welfare in India in December 2009 to provide reliable data for effective decision-making through name-based tracking of each client. More than 4.06 crore pregnant women and 3.3 crore children have been registered in the system since its inception. Few experiences of MCTS implementation have been documented in the states of Gujarat (e-Mamta), Tamil Nadu (Pregnancy and Infant Cohort Monitoring and Evaluation System — PICME), Rajasthan, and Chhattisgarh. MCTS involves entry of huge volumes of data generated at the grassroot level, which is usually the subcentre. The data is then compiled at different levels and transmitted to the next higher level. It is very essential to identify the operational aspects of its implementation at each level, especially at the level where data are generated, i.e., at the subcenter (SC) and at the fi rst point of data entry, i.e., primary health center (PHC).

Interrupted supply of electricity and slow server speed are the two major challenges in remote rural locations. A dedicated computer assistant with high-speed Internet connectivity is the basic requirement for regular entry and update of the database. Currently, the MCTS portal is an absolute online version and it cannot operate if there is no or poor Internet connectivity. Adding a feature for offl ine data entry process followed by online uploading to the server would be useful. Distribution and collection of the immunization work plans (due list of clients) must be tagged with alternate vaccine delivery mechanism for ensuring timely availability of the same at session sites.

Regular mechanism for review, feedback, and feedforward of MCTS status and use need to be

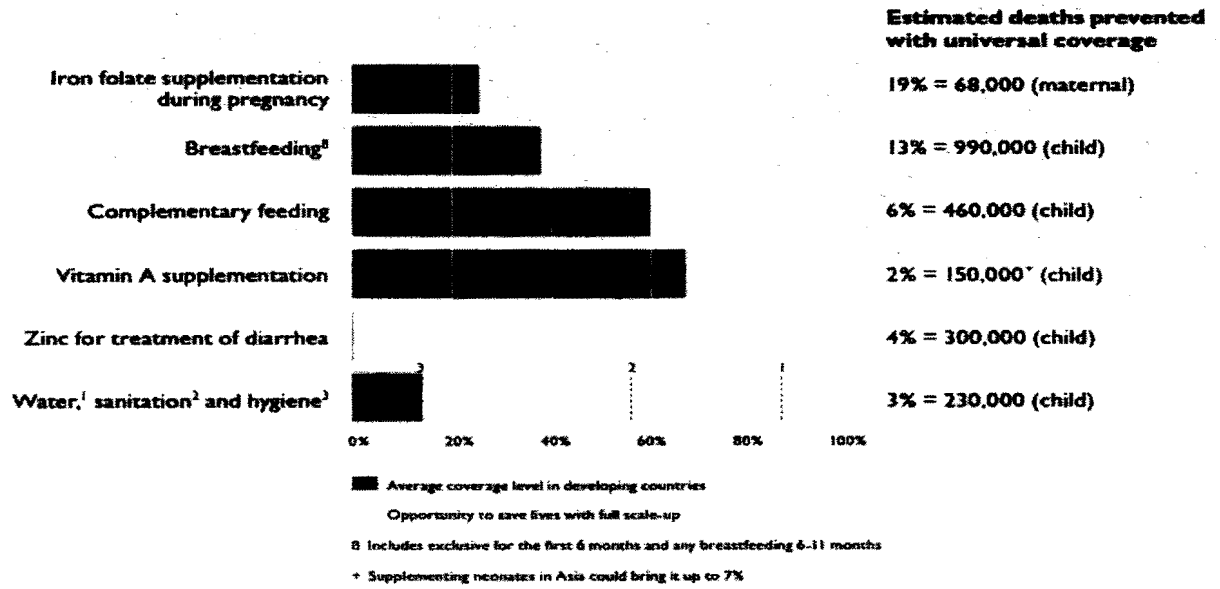
established at PHC, district as well as higher levels. Poor interpretation and poor use of data have been demonstrated in the evaluations of information systems of different countries (Nagarajan et al 2015).

COMMENTS

1. **Good Document:** RCH-II program and RMNCH A Plus documents are elaborated and well written. First time the program is based on various research studies carried out in the country and abroad. Minor details are given and scope of expansion of ideas is also provided. It gives plan of implementation to each state and district.
2. **Goals:** Observing various goals and objectives set in 10th five year Plan, RCH-II, National Population Policy and also Millennium Development Goals, it appear unrealistic that IMR will fall 5 points in 2 years or 1 year by 2010. Similarly MMR will also fall 50 points in 1 year and TFR from 2.3 to 2.1. With out substantial increase in couple protection rate. Target for universal immunization was set for 1990 which was not achieved by 2005 and expecting it to be achieved in 2010 was unrealistic.
3. **Planning problem:** Experience within, as well as outside the country, show that a reduction in population growth rates follows overall socioeconomic development. Yet this has largely been ignored during planning process, possibly as it prevent planners from blaming the country's tardy development rates on the pressure passed by population increase (Gupta 1998).
4. **Paternalistic bias of the program:** Tubectomy rates are still higher than vasectomy although latter is a far simple and safer procedure. All the methods of contraceptives are directed towards female users. There is always more emphasis on female sterilization. There are very few contraceptive methods available for male. Most of the methods like hormonal preparations, tubectomy, are not accepted by every women. Condom used in high risk people is very low according to a study.
5. **Strategy problem:** Life saving six is another concept originated in UNICEF document to indicate important action areas. All six components of initiatives are nutritional related (Figure 8.14.).

   One of the strategies is to increase male involvement in reproductive health but not much work has been done on this. There are many myths and misconceptions as far as male involvement is concerned. Some men fear that if a woman is not at risk of pregnancy, she will be promiscuous. Other reasons for failure to use family planning methods include lack of communication between spouses, lack of access of contraceptives, the beliefs that women alone are responsible for fertility control, and the lack of availability of sufficient family planning information. Fear of side effects in males is another reason of not getting involved in reproductive health (Chankapa et al 2010).
6. **Unmet need of emergency contraceptives** has been highlighted but how this can be provided to people is a challenge. It has been documented that 78% conceptions are unplanned and 20-25% are definitely unwanted. There could be many reasons for unplanned intercourse which sometimes can't be avoided but conception can be prevented. Emergency contraceptives like hormonal (within 72 hours 4 pills of Mala D) and Intrauterine Device insertion within 5 days may be considered and should be made available at every health institutions. Program manager must ensure that methods are available close to people. But it is found that knowledge of correct dose and timing of E-pills among medical officers of government dispensaries was 32% and 49%. There were reservations among doctors to promote e-pills (Kishore V, et al 2010). According to recent report of NRHM 2013 the unmet need of family planning reduced to 12% but contraceptive prevalence is only 54.1% so there is still a huge gap and mismatch of the figures. Community based research is lacking on contraception. Why people do not use them when it is available? What technologies are required to make the contraceptives more user friendly? Operational research in contraceptives is urgently required (Pachori S 2014).
7. Reproductive and child health program is still focusing on reproduction rather than health (Gupta 1998). At the same time "major issues of MCH" has been lost in vast structure of RCH-II. Instead of five clean birth attendants should be told about **Seven Cleans**- *Clean hands, Clean surface, Clean cord tie, clean razor blade and clean*

Figure 8.14: Over half the world's Children Do Not Have Access to the Lifesaving Six


Estimated deaths prevented with universal coverage
Iron folate supplementation during pregnancy
19% = 68,000 (maternal)
Breastfeeding[8]
13% = 990,000 (child)
Complementary feeding
6% = 460,000 (child)
Vitamin A supplementation
2% = 150,000* (child)
Zinc for treatment of diarrhea
4% = 300,000 (child)
Water,[1] sanitation[2] and hygiene[3]
3% = 230,000 (child)
0%
20%
40%
60%
80%
100%
Average coverage level in developing countries
Opportunity to save lives with full scale-up
8 Includes exclusive for the first 6 months and any breastfeeding 6-11 months
* Supplementing neonates in Asia could bring it up to 7%

cord stump (no applicant), *clean towel*, and *clean water* for hand washing.

8. In reproduction also **breastfeeding** is focusing on pregnant and lactating mothers. However, their attitude and behavior is already formed in their adolescence. In one of our study it was found that college girls had knowledge but also having myths and wrong beliefs. Science students have better knowledge than students of art and commerce (Suman Lata et al 201). This difference need to be removed.
9. **Behavior change communication** and health promotion activities should be promoted in users focusing on myths, misconceptions, and adverse belief systems regarding reproduction and sexuality. Program does not give enough emphasis on behavior change communication on diet, compliance of iron & folic acid pregnancy and care during neonatal period which is in fact very effective method to improve delivery and neonatal care (Mamta et al 2013).
10. **Female feticide** is still higher in rural and some selected urban areas. Mere formulation of legislation is not going to help. Female status in family, community and national level need to be raised. Doctors and health workers should be sensitized for not doing any malpractice of aborting female fetus. Public should be made aware of this problem (Kishore 2004).
11. **Organization structure:** Launching of National Rural Health Mission by the Central Government recently added another dimension to the implementation of RCH-II. Government desires the implementation of RCH-II through National Rural Health Mission and panchayat should monitor the program at peripheral level. At the upper and middle levels the RCH-II program is now more confusing and need to be made more clear urgently. At the ministry level there is confusion of control over the program. Bureaucratic control of NRHM and technical control of health services are colliding on various issues (Kumar A, CMO, Govt. of India, Personal Communication).

    This is very vast program and need special organizational structure to implement the various components of Program carried out for proper coordination. More emphasis has been given on management skills and accountability. "Free services" particularly contraceptives to all beneficiaries from the health centers led to huge wastage mainly because of lack of effective distribution and monitoring system. Most of these services goes to well off people than those who

really deserve. Document highlights the methods of reducing the cost and cost recovery however, real test is its effective implementation.

12. **Infrastructure and Facilities:** The facility survey undertaken as a part of RCH project in 2002 has brought out the serious shortfalls in physical infrastructure, staff and supplies at pubic heath institutions. The survey considered a heath institution as adequately equipped if it had 60 percent of the critical inputs. According to this criterion, at the all India level, only 36 percent of the PHCs had adequate physical infrastructure such as building, water and electricity supply, laboratory and labor room, vehicle etc., 38 percent had adequate staff in position, 31 percent had adequate supplies of kits, drugs, vaccines and contraceptives, and 56 percent had the adequate equipments in function, such as weighing machine, vaccine carrier, BP instruments, autoclave, etc. The position of CHCs, FRUs, and district hospitals were somewhat better, but they too had severe shortage of supplies. There is inadequate supplies. The staff in position in CHCs and FRUs was also far from adequate. In EAG states, the position of PHCs was far worse than the all India average. It was also observed that medical and paramedical staff had received adequate in-service training. The FRUs/CHC and district hospitals attended few referred cases of delivery in a month. With this infrastructural shortfall the achievement of RCH Goals appeared to be difficult. During monitoring and review of RCH and JSY activities many deficiencies are found. Infrastructure is poor in many districts. Reporting of services is fake, and beneficiaries are not getting any payment of JSY (Wafai S. Personal Communication 2009).

13. Quality of care: Quality of RCH services are not good. The focus is more on infrastrucure (input) than process of program. In a study conducted in Gujarat it is found that the quality of child health services is poor because of lack of process indicators (Chavda P et al 2015).

14. **Social factors:** In spite of obvious challenges, evidence suggests that, in practice, the application of existing program of reproductive rights principles lags far behind the theory (Jacobson 2000). In the country of caste discrimination, providing just and fair distribution of services is real challenge. From top to bottom the government functionaries are not willing to provide appropriate services to scheduled castes and tribes. This program has no mechanism to handle such challenges. In spite of all efforts the ANC coverage is poor and home deliveries are common occurence. Most common reasons cited is lack of time, unfelt need of hospital delivery, family pressure, social customs and lack of faith in hospitals (Bhavarva N et al 2015).

    Despite moderate success in reducing MMRs and increasing antenatal care coverage, the global targets associated with SDG seem unlikely to be attained by 2025, especially in many low income states. So far, practical initiatives to address these issues have tended to adopt centralised, public provision of antenatal care based on utilitarian strategies designed to minimise clinical risk. This approach benefits some women and infants, but it marginalises others, as the programme design does not take into account necessary survival decisions, beliefs, attitudes, or cultural theories that may be intrinsic to the local context. Measures designed to sustain and maintain access in low income countries are likely to be more effective when policy makers and service providers address the local issues. Such programs must ensure that, once they access services, all pregnant women are treated with dignity, respect, and compassion. If program delivery is not aligned with local contexts in this way, even the best and most physically accessible services may remain underused by some local pregnant women (Finlayson & Downe 2013).

15. **Kangaroo Mother care:** In a systematic review conducted by Chan et al 2016 on 112 qualitative studies it was concluded that there are several barriers to implementing kangaroo mother care, including the need for time, social support, medical care and family acceptance. Barriers within health systems included organization, financing and service delivery. In the broad context, cultural norms influenced perceptions and the success of adoption.

16. **Referral system and proper feedback** is still lacking in majority of areas. More monitoring and supervision is needed for proper implementation

of Program. Referred cases are not handled adequately and sympathetically at the higher center.

17. **Involvement of medical colleges** for training of medical and paramedical students is urgently needed (Lal 2001). Another challenge for teachers is to make the student understand the concept and practical aspect of the program. Recent efforts of NRHM to involve the medical and nursing colleges in training of medical and paramedical are also limited.
18. The Government is optimistic about **IMNCI strategy** and willing to adopt it fully to deliver child health. However, it should be understood that IMCI strategy is for sick child and not for promotion of child health. Algorithm of IMNCI is very exhaustive and difficult to practice in field by health workers mainly AWW, ASHA, and ANM. These workers are treated as of same standard however, their level of education and experience is different. The intervention is not much field tested before adopting at the national level. Following algorithm is time consuming and remembering the long algorithm by worker is impossible. Availability of cards at all places and all time is another challenge. IMCI program was evaluated in Africa and found no extra-benefit over other conventional strategy which highlights the need of dedication of worker, extensive training of workers, support and supervision in the fields.
19. **Community Need Assessment** is never carried out by ANM with the help of AWW. Now this job is expected from ASHAs. Health plans are not made on regular basis which led to deficiency of resources. Payments to ASHAs are not made on time (Wafai S, RD J&K Personal Communication 2014).
20. **Monitoring:** Lack of appropriate training, overburdened data entry operator (DEO) and auxiliary nurse midwife (ANM), poor Internet connectivity, slow server speed, and frequent power failures were revealed as major limitations for the effective implementation of Mother and child tracking system. Nearly 18% of the clients reported receiving short message service (SMS) and only 6% could understand the SMS.
21. **Mental disorders** are common in mothers during pregnancy and after delivery which is directly affecting their own health and child's health. There are evidences that around 16% of mothers who delivered suffered from postpartum depression and many more suffer from anxiety. These mental illnesses directly and indirectly affect the nutrition of newborns. There are no facilities to handle such illnesses at peripheral institutions. Quality of care can not be ensured in such situations. Mental services such as counseling to all mothers delivering should be provided (Gupta S, Kishore J, Mala Y, et al 2013).
22. Reproductive health program do not address the issue of smoking (active & passive) because it causes adverse effects on fetus development and result in low birth weight, small gestational period and still birth (Gupta 2004, 2006).

Mother-Friendly Childbirth Initiative

Mother friendly hospitals or birth centers or home birth services are promoted by the Coalition for Improving Maternal Services (CIMS) is started in United States and now the philosophy getting more value through reproductive and child health program in the country. Following ten criteria are selected for mother friendly hospitals:

1. Offers all mothers giving birth: a) unrestricted access to the birth companions of her choice, including fathers, partners, children, family members, and friends; b) unrestricted access to continuous emotional and physical support from a skilled woman-for example, a labor support professional; c) access to professional midwifery care.
2. Provides accurate descriptive and statistical information to the public about its practices and procedures for birth care, including measures of interventions and outcomes.
3. Provides culturally competent care-that is, care that is sensitive and responsive to the specific beliefs, values, and customs of the mothers ethnicity and religion.
4. Provides the woman giving birth with the freedom to walk, move about, and assume the positions of her choice during labor and birth (unless restriction is specifically required to correct a complication), and discourages the use of the lithotomy (flat on back with legs elevated) positive.

5. Has clearly defined policies and procedures for: a) collaborating and consulting throughout the perinatal period with other maternity services, including communicating with the original caregiver when transfer from one birth site to another is necessary; b) linking the mother and baby to appropriate community resources, including prenatal and post-discharge follow-up and breastfeeding support.
6. Does not routinely employ practices and procedures that are unsupported by scientific evidence including but not limited to the following: a) shaving, b) enemas, c) IVs, d) withholding nourishment, e) early rupture of membranes, and f) electronic fetal monitoring.

   Other interventions are limited as follows: a) has an induction rate of 10% or less, b) has an episiotomy rate of 20% of less, with a goal of 5% or less, c) has a total cesarean rate of 10% or less in community hospital, and 15% or less in tertiary care (high risk) hospitals, and d) has a VBAC (vaginal birth after cesarean) rate of 60% or more with a goal of 75% or more.
7. Educates staff in non-drug methods of pain relief and does not promote the use of analgesic or anesthetic drugs not specifically required to correct a complication.
8. Encourage all mothers and families, including those with sick or premature newborns or infants with congenital problems, to touch, hold, breastfeed, and care for their babies to the extent compatible with their conditions.
9. Discourages nonreligious circumcision of the newborn.
10. Strives to achieve the WHO-UNICEF "ten steps of Baby-Friendly Hospital Initiative" to promote successful breastfeeding.

Mother Baby Friendly Health Services

There are guidelines for Baby Friendly Hospital Initiative which was launched in 1991 jointly by UNICEF and WHO. UNICEF has also developed a toolkit for perinatal referral transport in 2010. However, there is a need to build on these experiences to make the services "Mother and Baby Friendly". Two meeting of Core Expert group have been held with the objective to develop minimum set of standard to make a health facility "Mother and Baby friendly".

The expert group has come out with the final draft of the guidelines and recommendations for "Mother Baby Friendly Health Services".

The following ten standards have been recommended explaining their objectives, process criteria, indicators and monitoring tools –

- Standard 1 - Facility ensures right of the mother and baby to stay safely with dignity
- Standard 2 - Infrastructure is designed optimally for easy mobility and comfortable stay of the client.
- Standard 3 - Service providers have necessary behavioral and technical skills to provide integrated maternal and newborn services
- Standard 4 - Protocols for clinical care for mother and newborn are in place and implemented
- Standard 5-Early initiation of breast feeding, exclusive breast feeding for 6 months and rooming-in
- Standard 6 - Infection prevention/ control practices and biomedical waste management implemented
- Standard 7 - Linkages and networking with availability of perinatal transport
- Standard 8 - Grievance redressal system is functional
- Standard 9 - Audits are done periodically
- Standard 10 - Self-appraisal, recertification system established

Following are the suggested recommendations to implement the standards and make a facility accredited for Mother- & Baby friendly Health Services (MBFHS):

- Standards are endorsed by professional bodies such as FOGSI, NNF, TNAI, IMA, INC, IAP, and ICMR.
- Accreditation of facilities for MBFHS should be done by National Accreditation Board for Hospitals and Healthcare Providers (NABH).
- To ensure ownership of this process, programme management structure at national and state level should be identified: Incorporating the process in national and state PIP to institutionalise the process (allocation of budget, staff, and other required resources) Dedicated focal point Monitoring committees at national, regional and state levels
- Capacity building process should include healthcare providers as well as the management and support staff

- Develop national guidelines on audit, grievance redressal, self-appraisal / recertification.
- Suitable mechanism for the region should be explored to encourage private sector to adopt MBFHS.

Comments

These standards are general statements and do not included local needs and consultation. Indian Public Health Standards are already in place for subcenter, PHC, CHC and MBFHS should have acknowledged them and drafted these standards keeping its provision. They are the outcome of Baby friendly hospital initiatives and Mother Friendly Childbirth Initiative and nothing new or inovative in nature. Audit and appraisal system suggested for monitoring is superficial and does not included panchayat and local bodies. In hospitals and private centers standards should be field tested before endorsing. There is no mechanism suggested how to deal with grievances, and redressal. Even the suggestions suggested in 2012 document of government are vague and not action oriented (Govt of India 2012). Baby friendly initiatives has been promoted for last twenty years but there is no evidence that decrease in IMR and underfive mortaility is initiative related. Similarly no study is documenting that the improvement of mother & Baby friendly health services has made impact on MMR and IMR.

References

Abiodun Raufu. Polio cases rise in Nigeria as vaccine is shunned for fear of AIDS (News). BMJ 2002; 324: 1414.

Agol VI. Vaccine-derived polioviruses. *Biologicals* 2006; 34: 103–08.

Ali M, et al. A global research agenda for family planning: results of an exercise for setting research priorities. *Bull World Health Organ* 2014;92:93–98.

Andrus JK, et al. Risk of vaccine-associated paralytic poliomyelitis in Latin America 1981-91. Bull WHO 1995; 73:33-40.

Andurkar SP et al. Study of unmet need for family planning among married women of reproductive age in Urban Health Center Field Practice area of government medical college, Aurangabad. Ind J Public health 50 (1): 45-46.

Arie S. Murder of nine polio workers in Nigeria threatens eradication efforts. *BMJ* 2013; 346 doi: http://dx.doi.org/10.1136/bmj.f954 (Published 12 February 2013)

Arita M, et al. A Sabin 3 derived poliovirus recombinant container a sequence homologous with indigenous human enterovirus species C in the viral polymerase coding region. J Virol 2005; 79:12650-7.

Arita I, Nakane M, Fenner F. Is polio Eradication realistic? Science 2006; 312: 852-54.

Arora NK, Basu S. Lessons from epidemiology of polio in India for Planning future strategies. In. Round Table Conference Series: Polio Eradication: Challenges and Opportunies 2010; 24: 31-46.

Asturias EJ, Dueger EL, Omer SB, et al. Randomized trial of inactivated and live polio vaccine schedules in Guatemalan infants. *J Infect Dis* 2007; 196: 692–98.

Armstrong J et at. Breastfeeding and lowering the risk of childhood obesity. Lancet 2002; 359 (9322): 2003-2004.

Ball & Wright. Health Care costs of formula feedings in the first year of life. Pediatrics 1999; 103 (4 Supl): 870-876.

Beaudry M et al. Relation between infant feeding and infections during the first six months of life. Journal of Pediatrics 1995; 126: 191-197.

Benerjee K, et al. Strategies for eradication of poliomyelitis-the Indian Experience. Ind J Public Health 2000; 44 (1): 5-14.

Bhatnagar P, Bahl S, Biswas P. Use of oral polio vaccine for polio eradication. JIMA 2005; 103:680-681.

Bavarva N, Patel PB, Bansal RK. Utilization of Maternal Care Ser-vices in Urban area: Still an Issue of Modern World. Ntl J of Community Med 2015; 6(2):125-129.

Boisson S, et al. Effect of Household-Based Drinking Water Chlorination on Diarrhoea among Children under Five in Orissa, India: A Double-Blind Randomised Placebo-Controlled Trial. PLoS Med 2013; 10(8): e1001497. doi:10.1371/journal.pmed.1001497.

Broor et al. Risk factors for severe lower tract infections in under five children. Ind Ped 2000; 38:1361-139.

Bulliyy G, et al Hemoglobin status of non school going adolescent girls in three districts of Orissa, India. Int J Adolescent Med Health 2007; 19: 395-406.

CDC. Pediatric nutrition surveillance 1997 full report. Atlanta GA: US Department of Health ad Human Services.

CDC. Update on vaccine-derived polioviruses—worldwide, January 2006–August 2007. *MMWR Morb Mortal Wkly Rep* 2007; 56: 996–1001.

CDC. http://www.cdc.gov/ncidod/diseases/hepatitis/b/country_listing.htm

Centers for Disease Control and Prevention (CDC). In the News. 2011 measles update. Atlanta: CDC; 2011. [Accessed 14 Jul 2011]. Available from: http://wwwnc.cdc.gov/travel/noticesin-the-news/measles.htm .

Chan GJ, Labar AS, Wall S, Atun R. Kangaroo mother care: a systematic review of barriers and enablers.Bull World Health Organ 2016;94:130–141J

Chankapa YD, Pal R, Tsering D. Male behavior toward reproductive responsibility in Sikkim. Ind J Comm Med 2010; 35 (1): 40-45.

Chavda P et al. Chavda P, Misra S. Evaluation of input and process components of quality of child health services provided at 24 × 7 primary health centers of a district in Central Gujarat. J Family Med Prim Care 2015;4:352-8.

Chawla R, Bansal AK, Indrayan A: Informatics technology in health care in India. Natl Med J India 1997, 10(1):31-5).

Chaudhary SM, et al. A study of anemia among adolescent females in the urban area of Nagpur. Ind J Com Med 2008; 33 (4): 243-245.

Chumakov K, Ehrenfeld E, Wimmer E, Agol VI. Vaccination against polio should not be stopped. *Nat Rev* 2007; **5:** 952–58.

Central Bureau of Health Intelligence. Health Information of India 2001. Govt. of India.

Cohen R et al. Comparison of maternal absenteeism and infant illness rates among breastfeeding and formula-feeding women in two corporations. Am J Health Promotion 1995; 10 (2): 148-153.

Committee of Immunization. Update on the recommendation of the academic to other agencies on immunization. Ind Ped 1999; 36: 785-87.

Crengle S. The development of Mori primary care service. *Pacific health Dialog* 2000; 7 (1): 48-53.

Cuba IPV Study Collaborative Group. Randomized, placebo-controlled trial of inactivated poliovirus vaccine in Cuba. *N Engl J Med* 2007; **356:** 1536–44.

Dennis CL. Breastfeeding initiation and duration: a 1990-2000 literature review. J Obs Gyne and Neonatal Nursing 2002; 31 (1): 12-32.

Dewey KC. Growth Characteristics of Breast fed compared to formula fed infants. Biology of the Neonate 1998; 74:94-105.

Dietz WH. Breastfeeding may help prevent childhood overweight. JAMA 2001; 285: 2506-2507.

Donta B, Begum S, & Naik DD. Acceptability of male condom-An Indian scenario. Indian J Med Res 140 (Supplement), November 2014, pp 152-156.

Duncan B et al. Exclusive breastfeeding for at least 4 months protects against otitis media. Pediatrics 1993; 91 (5): 867-872.

Ehrenfeld E, Glass RI, Agol VI, et al. Immunization against poliomyelitis: moving forward. Lancet 2008; 371: 1385–87

Escobar A et al. Tuberculosis among indigenous population in Rondonia, Amazinia, Brazil. *Cad saude publica* 2001; 17(2) 285-98.

European Centre for Disease Prevention and Control (ECDC). European measles monthly monitoring (EMMO), June 2011. Stockholm: ECDC; 2011. Available from: http://ecdc.europa.eu/en/publications/Publications/2011_June_measles_montly.pdf

Fine PE, Carneiro IA. Transmissibility and persistence of oral polio vaccine viruses: implications for the global poliomyelitis eradication initiative. *Am J Epidemiol* 1999; 150: 1001–21.

Fine PE, Sutter RW, Orenstein WA. Stopping a polio outbreak in the post-eradication era. *Dev Biol (Basel)* 2001; 105: 129–47.

Fink S. International efforts spotlight traditional, complementary, and alternative medicine. *American journal of Public Health* 2002; 92 (11): 1734-9.

Finlayson K, Downe S. Why do women not use ANC services in Low- & Middle Income Countries? A meta-analysis of qualitative studies. PloS Medicine 2013; 10(1): e1001373.

Geller R, Vignuzzi M, Andino R, Frydman J. Evolutionary constraints on chaperone-mediated folding provide an antiviral approach refractory to development of drug resistance. *Genes Dev* 2007; **21:** 195–205.

George Alex. "An enquiry into provision of abortion services in Madhya Pradesh: Final report submitted to AAP-I secretariat CEHAT, Mumbai". August 2003.

Giri VC, et al. Prevalence and pattern of childhood morbidity in a tribal area of Maharashtra. Indian J Public Health 2008; 52 (4): 207-209.

Gladwin J, Dixon RA, Wilson TD: Implementing a new health management information system in Uganda. Health Policy and Planning 2003, 18(2):214-224.

Govt of India. A Strategic Approach to Reproductive, Maternal, Newborn, Child and Adolescent Health (RMNCH+A) in India. Ministry of Health & Family Welfare Government of India. 2013. Available from http://www.unicef.org/india/1_RMNCHAStrategy.pdf.

Govt of India. Ninth Plan 1997-2002. Planning Commission. Govt. of India. Simplified STD Treatment Guidelines. NACO, Min of Health & Family Welfare 1993.

Govt. of India. Manual of Community Need Assessment Approach in Family Welfare Program. Dept. of Family Welfare, Ministry of H&FW, GOI, 1998.

Govt. of India. Reproductive & Child Health Services in Urban Areas. Ministry of Health & Family Welfare, Nirman Bhawan, New Delhi.

Govt of India. Standards and Guidelines of Mother and Baby Friendly Health Services. Division of Maternal Health & UNICEF, Min of HFW Govt of India 2012.

Govt. of India. Facilities based newborn care operational guidelines: Guidelines for planning and implementation. Ministry of H & FW, New Delhi 2011.

Grassly NC, Fraser C, Wenger J, et al. New strategies for the elimination of polio from India. *Science* 2006; **314:** 1150–53.

Gupta S, Mala Y, Kishore J, et al. Prevalence of Post partum depression in tertiary care hospital. JOGI 2013.

Gupta AS. World Bank's Reproductive and Child Health Approach: Old Wine in New Bottle. In: Reproductive Health in India's PHC. SSSciences, JNU, 1998.

Gupta PC et al. BMJ 2004; 328: 1538-40.

Gupta PC et al. Epidemiology 2006; 17: 47-51.

Halsey NA et al. Polio Project Team. Search for polioviruses carriers among people with primary immune deficiency diseases in the United States, Mexico, Brazil and the UK. Bull WHO 2004; 82: 3-8.

Hanenberg RS et al. Impact of Thailand's HIV-control programme as indicated by the decline of sexually transmitted infections. Lancet 1994;344:243-45.

Harish BN, Menezes GA. Antimibrobial resistance in typhoid salmonellae. ind J Medical Microbiology 2011; 29 (3): 223-9.

Hib in India. Available from: URL: http://www.hibaction.org/resources/HibinIndia.pdf Accessed August 13, 2009.

Hickman M, Miller D. Indigenous ways of healing guinea worm by the Sonninke culture in Mauritania, West Africa. *Hawaii Medical journal* 2001; 60 (4): 95-8.

IIPS. India: National Family Health Survey (NFHS-2) Key Findings 1998-1999. International Institute for Population Sciences Mumbai. http://nfhsindia.org/invitation_to_attend_ bidder %27s_meeting_for_ website.doc ; http://www.nfhsindia .org/anfhs.html.

Jacobson JL. Transforming family planning Program: Towards a framework for advancing the reproductive right agenda. Reprod. Health Matters 2000; 8 (15): 21-32.

Jindal N et al. Community based study of RTI/STI among rural population of Punjab, India. Ind J Com Med 2009; 34 (4): 359-61

John Hopkins Bloomberg School of Public Health. Info: Population Reports 2006; May-June

John TJ. Polio Eradication: A National Commission required. Economic and Political Weekly 2006; XLI (51): 5229-5234.

John TJ et al. Time to re-think vaccination schedule in India. Ind J Med Research 2011; 134: 256-59.

John TJ, Vashishtha VM. Eradicating poliomyelitis: India's Journey from hyperendemic to polio free status. Ind J Med Res 2013; 137: 881-894.

Johri M, et al. Strategies to increase the demand for childhood vaccination in low- and middle-income countries: a systematic review and meta-analysis. Bull World Health Organ 2015;93:339–346C.

Kansal A, Kandpal SD, Mishra P. Reasons for not practicing contraception in a rural population of Dehradun District J Commun Dis 2006 (1): 97-101.

Kaur M. Mainstreaming gender in Health. Indian J Com Med 2005; 30 (3): 75-77.

Kew OM, Sutter RW, et al. Vaccine-associated polioviruses and the end game strategy for global polio eradication. Annu rev Microbiol 2005; 59: 587-635.

Kishore J. A Dictionary of Public Health. 3rd Ed. New Delhi: Century Publications 2013.

Kishore J, Pagare D, Malhotra R, Singh MM. Qualitative study of wild polio cases in high risk districts of Uttar Pradesh, India. The National Medical Journal of India 2003;16:131-4.

Kishore J, Singh A, Grewal I, Singh SR, Roy K. Risk Behaviour in an Urban and a Rural Male Adolescent Population. The National Medical Journal of India 1999; 12: 107-110.

Kishore V, Misro MM, Deoki Nandan. Providers' Knowledge, attitude and dispensing practices of E-pills in Government dispensaries of south district of Delhi, India. Ind J Comm Med 2010; 35 (1): 46-51.

Khoury AJ et al. Breast feeding initiation in Low-income women: Role of attitudes, support, and perceived control. Women's Health Issues 2005; 15: 64-72.

Kohler KA, et al. Vaccine-associated paralytic poliomyelitis in India during 1999: decreased risk despite massive use of oral polio vaccine. Bull WHO 2002; 80:210-216.

Krishnan et al. Evaluation of computerized health management information system for primary health care in rural India BMC Health Services Research 2010, 10:310.

Kuroiwa C, Bongphrachanh P, Chosa T, et al. Risk of poliomyelitis importation and reemergence in Laos. Lancet 2000; 356: 1487-88.

Lal S. Strategies of incorporating RCH strategies and newer developments into curriculum to enrich teaching-training and research Program of Community Medicine. Ind J Com Med 2001; 26:161.

Lambrechts T et al. Integrated Management of Childhood Illness: First Experiences. Bull World Health Organ. 1999, 77(7): 537-616).

Lim SS, Stein DB, Charrow A, Murray CJL. Tracking progress towards universal childhood immunisation and the impact of global initiatives: a systematic analysis of three-dose diphtheria, tetanus, and pertussis immunisation coverage. Lancet 2008; 372: December 13

Li S. Ligation of vas deferens by clamping method under direct vision. Clin Me J 1976; 4: 213-4.

Li S, Goaldstein M, Zhu J, Huber D. The no scalpel vasectomy. J Urol 1999; 162: 1621-5.

Lodha R, Dash NR, Kapil A, Kabra SK. Diphtheria in urban slums in north India. Lancet. 2000 :15;355:204.

MacLennan C et al. Failure to clear persistent vaccine-derived neurovirulent poliovirus infection in an immunodeficiency man. Lancet 2004; 368:1509-1513.

Mamta, Singh SV, Kishore J et al. Effect of behavior change communication on delivery and neonatal health care practice in a resettlement colony of Delhi. Ind J Com Med 2013; 38(1): 42-48.

Marinova L, Muscat M, Mihneva Z, Kojouharova M. An update on an ongoing measles outbreak in Bulgaria, April-November 2009. EuroSurveill. 2009;14(50):pii=19442. Available from: <http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19442>.

Martinez-Bakker M, King AA, Rohani P (2015) Unraveling the Transmission Ecology of Polio. PLoS Biol 13(6): e1002172. doi:10.1371/journal. pbio.1002172

Mathew JL et al. Polio eradication and after: does IPV have a role? India Pediatrics 2001; 68SS1:S15-22.

McNeill ET et al. The Latex Condom, Family Health International, 1998.

Mehariya VK, Sheth JK, Bala DV. Study of Services Provided to Bene-ficiaries of Chiranjeevi Yojana in Urban Slum of Ahmedabad City of Gujarat. Natl J Community Med. 2015; 6(1):112-6.

Merson J. Bio-prospecting or bio-piracy: intellectual property rights and biodiversity in a colonial and postcolonial context. Osiris 2000; 15: 282-96.

Misra P, Goswami A, Pandav CS. A study of the perception, communication and coverage of pulse polio immunization program in a Delhi Slum. Ind J Pub Health 2004; XXXXVIII (4): 216-217.

Mittal SK et al. Polio Eradication in India: The way forward. Ind J Pediatrics 2007; 74 (2): 153-160.

Mittal S. Emergency congraception-Potential for women's health. Ind J Med Res 2014; 140(suppl): 45-52.

Mohanan M. Bauhoff S, La Forgia G, Babiarz KS, Singh K, Miller G. Effect of Chiranjeevi Yojana on institutional deliveries and neonatal and maternal outcomes in Gujarat, India: A difference-in-differences analysis. Bull World Health Organ 2014;92:187-94.

Murray CJL & Lopez AD. The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020. Global Burden of Disease and Injury Series, Cambridge, MA, Harvard School of Public health 1996:1.

Muscat M, Bang H, Wohlfahrt J, Glismann S, Mølbak K; EUVAC.NET Group. Measles in Europe: an epidemiological assessment. Lancet. 2009 Jan 31;373(9661):383-9.

Nagarajan P, Tripathy JP, Goel S. Is mother and child tracking system (MCTS) on the right track? An experience from a northern state of India. Indian J Public Health 2016;60:34-9.

NIN. Vit A status and requirement in pregnancy. Nutrition News 1997; 18 (1):1.

Pachori S. Priority strategies for India's family planning programme.Indian J Med Res 140 (Supplement), November 2014, 137-146

Palafox N et al. Cultural competence: a proposal for physicians reaching out to Native Hawaiian Patients. Pacific Health Dialog 2001; 8 (2): 388- 92.

Pal D et al. Help-seeking patterns for children with epilepsy in rural Indian: implications for service delivery. *Epilepsia* 2002; 43 (8): 904-11.

Patel UV, Patel BH, Bhavsar BS, Dabhi HM, Doshi SK. A retrospective study of diphtheria cases in Rajkot, Gujarat. Indian J Community Medicine 2004; 29 (4):161-163.

Paul Y. Polio Eradication: A mirage? Indian J Clinical Practice 2004; 15 (7): 41-44.

Paul Y. Polio Eradication Program: A failure. Economic and Political Weekly 2006: XLI (43 & 44): 4538-4540.

Pervanidou D, Horefti E, Patrinos S, Lytras T, Triantafillou E, et al. Ongoing measles outbreak in Greece, January to July 2010. Eurosurveillance, Volume 15, Issue 30 [edited]. Also available.<http://www.eurosurveillance.org/ViewArticle.aspx?ArticleId=19629>

Powell D, Stewart D (2001). Children: the unwitting target of environmental injustices. *Pediatric Clinics of North America,* 48 (5): 1291-92.

Patwari AK & Raina N. Integrated Management of Children illness (IMCI): A robust strategy. Ind J Pediatrics 2002; 69 (1):41-48.

Public Health Agency of Canada (PHAC). Measles: global update. Travel health notice. Ottawa: PHAC; 2011. [Accessed 14 Jul 2011]. Available from: http://www.phac-aspc.gc.ca/tmp-pmv/thn-csv/measles-rougeole-eng.php

Rajanratnam J et al. Prevalence of anemia among adolescent girls in rural tamil nadu. Indian Pediatrics 2000; 37: 532-6.

Rao VK. Prevalence of nutritional deficiency signs in rural hyderabad preschool children by age. Nutrition News NIN, Hyderabad 1984; 5 (3): 4-9.

Ruikar MM, et al. Physical wife abuse in an urban slum of Pune, Maharashtra. Ind J Public Health 2008; 52 (4): 215-217.

Razum, et al (Letter). In. Difficulties in polio eradication. Lancet 2001; 357: 476.

Robert L. Polio Eradication: Is it time to give up? Science 2006: 312: 832-835.

Sathyamala C, O. Mittal, R. Dasgupta, R. Priya, *Int. J. Health Serv.* 35, 361 (2005).

Save the Children. http://www.savethechildren.in/about-us/who-we-are/85-latest-news/283-world-breastfeeding-week-to-raise-awareness-about-saving-new-borns.html.

Simmons D, Voyle J. Reaching hard-to reach, high-risk populations: piloting a health promotion and diabetes disease prevention programme on an urban areas in New Zealand. *Health Promotion International* 2003; 18 (1): 41-50.

Single E et al. *Canadian profile: Alcohol, Tobacco and Other Drugs.* Ottawa, Canadian Center on Substance Abuse and the Center for Addition and Mental Health. 1999.

Singh AB et al. Knowledge of emergency contraception among intern doctors. Journal of Medical Science 2005; 19 (1): 13-15.

Singh S et al. Emergency contraception: Knowledge and view of doctors in Delhi. Health and Population Perspectives and Issues Jan-March 2002; 25(1): 45-54.

Singhal T, Lodha R, Kapil A, Jain Y, Kabra SK. Diphtheria-down but not out. Indian Pediatr. 2000 ;37:728-38.

Srivastava RN. Polio Eradication in India. BMJ-South Asia Ed 2003; 19: 684.

Shrivastava A, et al Caution needed in ursing oral polio vaccine beyond the cold chain: Vaccine vial monitor may be unrealible at higher temperture. In J Med Sc 2012; 135: 520-22.

Shulman LM, Manor Y, Sofer D, Swartz T, Mendelson E. Oral poliovaccine: will it help eradicate polio or cause the next epidemic? *Isr Med Assoc J* 2006; 8: 312–15.

Smith M, Madon S, Anifalaje A, Lazzaro-Malecela M, Michael E: Integrated Health Information Systems in Tanzania: Experience and Challenges. EJISDC 2008, 33(1):1-21.

Suman Lalta, et al. Knowledge and Attitude Regarding Breastfeeding among College Girls of a Selected College of Ludhiana. Journal of Nursing Science and Practice 2012;2(1): 1-6.

Suresh K. Polio Eradication- A success in Sight. Ind J Public Health 2000; 44 (1): 15-22

TOI. Diphtheria, measles on a killing spree. The Times of India, New Delhi, November 8, 2004; pp 12.

Toteja GS, et al. Prevalence of anemia among pregnant women and adolescent girls in 16 districts of India. Food Nutr Bull 2006; 27: 311-5.

Tripathi R et al. Emergency Contraception: Knowledge, attitude and practices among health care providers in North India. J Obstet Gynecol Res 2003; 29(3): 142-6.

UN. People and the Planet, UN World Water Development Report (WWDR). http://www.wateryear2003.org/en/ev.php- URL_ID=1600&URL_DO= DO_ TOPIC&URL_SECTION=201.html

UNFPA, Population Council. Reproductive tract infections: a guide for program managers. New Delhi 2001

UNICEF. Annual report 1992, UNICEF 1992, pp.20-22

Van Oostdam J et al. Human health implications of environmental contaminants in Arctic Canada: a review. Science of the Total Environment 1999; 230 (1-3): 1-82.

Vashishtha VM. VM. Introduction of Hib Containing Pentavalent Vaccine in National Immunization Program of India: The Concerns and the Reality! Indian Pediatrics 2009; 46 781-82

Vatsayan A, et al. Hindustan Antibiotics Bulletin 1996; 38 (1-4): 66.

Ved RR, Dua AS. Review of women and children's health in India: Focus on safe motherhood. In. National Commission on Macroeconomics and health. Ministry of Health & Family Welfare, Govt. of India 2005.

Walker F et al. Zinc during and in convalescence from diarrhea has no demonstrable effect on subsequent morbidity and anthropometric status among infants <6 mo of age. American Journal of Clinical Nutrition 2007;85:887- 94

WHA. Global Alliance for Vaccine and Immunization. World Health Assembly 53.12; 2000.

WHO-SEARO. Health Situation in the South-East Asia Region 1994-97. WHO, ND 1999.

WHO. New Formula oral rehydration salts. Drug Information 2002; Vol. 16, No. 2.

WHO. "Integrating STI management into family planning services: What are the benefits?". 1999. p 26-28.

WHO. http://www.who.int/mediacentre/factsheets/fs204/en/index.html

WHO. Guidelines for Administration of Emergency Contraceptive Pills for Medical Officers. http://ec.princeton.edu/questions/ec-review.pdf; http://www.whoindia.org/en/Section6/Section7/Section300_1297.htm

Yoshida H, Horie H, Matsuura K, Miyamura T. Characterization of vaccine derived polioviruses isolated from sewage and river water in Japan. Lancet 2000; 356: 1461-63.

CHAPTER 9

REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAM (RNTCP) : DOTS STRATEGY INCLUDING DOTS PLUS

INTRODUCTION

Tuberculosis is a worldwide, chronic communicable bacterial disease. It is a very strange disease because of its varied clinical presentation, host response, chemotherapeutic response, etiology, and social implications. It is a very ancient disease and its description has also been found in the ancient Buddhist and Chinese writings. Even the Egyptian mummies as old as 500 BC show the evidence of man suffering from tuberculosis. Tuberculosis is known by many names in India as *'Kshyya Rog'*, *'Tapedik'* , *'Rajayaakhsma'* whereas in western world it is known as *phthisis*, in Romans as *tabes*, in Greek it was *consumption*. Hippocrates (460-377 BC) had also made few observations on tuberculosis.

It is caused by Mycobacterium *tuberculosis* (Mt) which is commonly known as "Koch's bacillus" or tubercle bacillus or Acid Fast Bacillus (AFB) discovered by Dr. Robert Koch his birthday on 24th March in 1882 (the day celebrated as World TB Day). Occasionally Mycobacterium *bovis,* M *africanum,* and atypical or opportunistic Mycobacterium *such as* M *kansasii,* M *avium,* M *intercellulare,* M *scrofulaceum,* M *malmoense,* M *xenopi* can also cause tuberculosis. The most common organ involved in TB is lung but it can involve any organ of the human body. It usually affects human in age group of 15 to 59 years, which is the most productive age group. Because of which community suffers from economic, social and health burden.

BURDEN OF DISEASE

Incidence of TB is defined as the number of new and relapse cases of TB (all forms) occurring in a given year. Relapse cases are defined as people who have been previously treated for TB and for whom there was bacteriological confirmation of cure and/or documentation that treatment was completed. Relapse cases may be true relapses or a subsequent episode of TB caused by reinfection.

Prevalence of TB is defined as the number of cases of TB disease (all forms) at a given point in time (the middle of the year).

Mortality is defined as the number of deaths caused by TB, excluding deaths occurring in HIV-positive TB cases, according to the definitions used in the 10th revision of the International Classification of Diseases (ICD-10). Estimates of deaths caused by TB in HIV-positive cases are presented separately. TB mortality is defined by WHO as the number of TB cases dying during the treatment, regardless of the cause of their death.

The **case fatality rate** is defined as the risk of death from TB among people with active TB disease.

World: It continues to be one of the most important public health problems worldwide (Enarson 1995). It infects one third of the world's population at any point of time. Tuberculosis (TB) is contagious and airborne. It is a disease of poverty affecting mostly young adults in their most productive years. The vast majority of TB deaths are in the developing world. 1.5 million people died from TB (including 480 000 women) in 2014, including0.4 milllion with HIV,. The TB death rate has fallen by 47% since 1990, and the number of deaths is also declining.

TB is among the three greatest causes of death among women aged 15-44. There were 9.6 million TB cases (3.2 million women) in 2014. The estimated global incidence rate fell to 174 cases per 100 000 population in 2014.

Globally, the percentage of people successfully treated reached the highest level at 86% in 2008. Since 1995, 41 million people have been successfully treated and up to 6 million lives saved through DOTS and the Stop TB Strategy. 5.8 million TB cases were notified through DOTS programmes in 2009

Of the 22 TB high burden countries, 13 countries are on track to meet the 2015 Millennium Development Goal target and 12 countries are on track to reach the 2015 Stop TB Partnership targets.

World Bank has estimated global burden of TB in terms of DALYs loss and stated that tuberculosis stands 7th in the ten leading causes of global Disability Adjusted Life Years (DALYs) loss and expected to maintain its position even in 2020 AD (Murray 1997). Because of its severity and consequences, in 1993, WHO has declared tuberculosis as a "global emergency".

India: In 2015, out of the estimated global annual incidence of 9.6 million TB cases, 2.2 million were estimated to have occurred in India. This makes India the highest TB burden country in the world. One sputum positive patient can infect 10–15 persons in a year if left untreated.

Unfortunately the prevalence and incidence rates have remained the same as in 1954-58 and thus with the increase in the country's population, the absolute number of TB cases are expected to increase by many folds. On the other hand, pandemic of HIV infection has already appeared with tuberculosis in a very serious mode. Another threat is multidrug resistant tuberculosis, for which a fire fighting strategy is required otherwise this may lead to failure of all efforts that are being made to control TB by this time. The District Tuberculosis Control Program, which was started in 1962, has been unable to make any dent over TB problem in the country. During this long period of operation of National Tuberculosis Control Program, all districts still had not been covered (GOI 1992).

Table 9.1: TB burden in India in 2015

TB Burden	Number (millions) (95%CI)	Rate Per 100 000 persons (95%CI)
Incidence	2.1 (2–2.3)	167 (156-179)
Prevalence	2.5 (1.7-3.5)	195(131–271)
Mortality	0.22 (0.15-0.35)	17 (12 - 27)

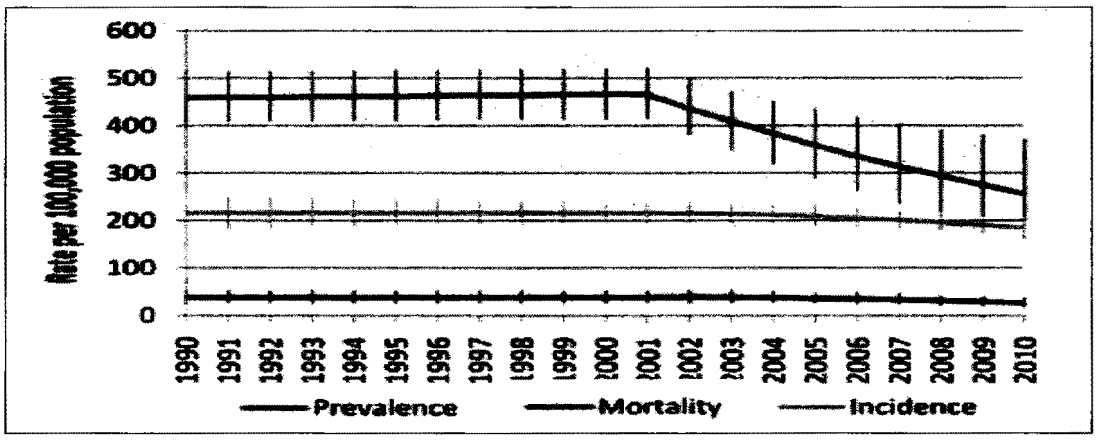
Annual risk of infection or ARI is the most informative index of magnitude of problem of tuberculosis. It is the best indicator of trend of tuberculosis unaffected by current control measures. It means proportion of population, which will be primarily infected in course of one year expressed as percentage. ARI in India is between 1% - 2%. It is estimated that there are 50 smear positive cases per lakh of population for every 1% rise of ARI. Estimated number of TB patients based on presumed ARI of 1% will be as under:

- New smear Positive cases = 50/lakh/year
- New smear Negative case = 50/lakh/year
- Retreatment cases (50% of new smear positive cases) = 25/lakh/year
- Extra-pulmonary and smear negative seriously ill (20% of new smear positives) = 10/lakh/year

Total cases would be 135/lakh/year. The present incidence and prevalence in 2015 are given in Table 9.1. The rates decreased after 2005 (Fig 9.1 & Table 9.2).

Annual incidence of culture positive pulmonary tuberculosis may have ranged from 800–2500 per 100,000 populations. The 2008 weighted, pooled bacteriologically-confirmed pulmonary TB prevalence estimate for adults was 327 (212-424) per 100,000 population. This result was adjusted to include estimates for paediatric TB prevalence. Various rates

Figure 9.1 and table 9.2: Trends of TB burden in India 1990–2010 (Source, WHO Global TB Control Report, 2011)



Year	Mortality rate	Incidence per lakh	Prevalence per lakh	% of smear + in New Pul case
1990	43	168	338	-
1995	19	168	234	23
2000	24	168	248	35
2005	26	168	258	56
2009	23	168	249	60
2010	26	185	256	

of TB are given in Table 9.3. In some areas such as Nicobar Island the ARI is 2.4% and active TB case rate is 728 per lakh population which is little higher than the rates observed in 1986 (ICMR 2005).

Socio-Economic Burden

Premature death (more than 80%) is the main cause of the burden of tuberculosis, as measured in terms of disability-adjusted life years (DALYs) lost. TB kills more people in India than HIV/AIDS, STD, Malaria, Leprosy and tropical diseases combined.

Tuberculosis causes poverty but also found more amongst poor. The majority of its victims are migrant laborers, slum dwellers, residents of backward areas and tribal pockets. Poor living conditions, malnutrition, shanty housing and overcrowding are the main reasons for the spread of the disease.

Every year, 3 lakh children are forced to leave school because their parents have tuberculosis, and one lakh women lose their status as mothers and wives because of the social stigma. TB deaths among women have major implications for child survival, economic productivity and family welfare. The social stigma of the disease adds to the burden for both men and women. Men have to deal with the stigma at their workplaces and in the community while women are ostracized in the household and neighborhood. The direct and indirect cost of TB to the country amount to Rs. 13,000 crore per year (US$ 3 billion). Every year, more than 17 crore days are lost to the National Economy on account of tuberculosis at a cost of Rs. 700 crore (GOI 2001).

The overall unit provider cost to treat a tuberculosis patient was calculated as Rs. 13462 for category I, Rs. 13654 for Category II and Rs. 13347 for category III (ICMR 2005). Now cat II & III are mesfed drop fresh estimates are not made.

Characteristics of Tubercle Bacilli

1. Mycobacterium tuberculosis is nonmotile, non-spore forming, and rod shaped bacillus that does not produce toxin.
2. On staining with carbol fushin by Ziehl Neelsen method they resist decolorization by 25% sulphuric

Table 9.3: Important Rates in relation to burden of Tuberculosis

Prevalence of TB Infection	30%
Incidence of TB Infection (ARI)	1.4% in 0-4 years, 2.1% in 0-14 years, 1.5% is average*
Incidence of Active TB	168 / 100,000/ year
Incidence of Sputum Positive	075 / 100,000/ year
Prevalence of all cases Radiologically active Sputum -Neg	256/1,00,000/ person
TB Mortality (All cases/100,000)	26
Prevalence of Sputum Positive	0.4%
Primary Drug Resistance	3-18%
Primary Resistance to INH	10.6-21.83%
Primary Resistance to Rifampicin	0-11.9%
Acquired Resistance to INH	34.5%-67%
Acquired Resistance To Rifampicin	0-53.26%
Ethambutol Resistance	0-20.6% (0.5%)
Streptomycin Resistance	0-35.8% (2.4%)
Any One drug Resistance	1.7%-36.9% (mean 10.7%)
Multi Drug Resistant TB	3.5-42.3%
Resistance to 4 drugs in new cases	0%-14.1% (mean 1.0%)

* Average ARI is 1.5% according to WHO and GOI report 2008 (Paramasivan 1998, Jain et al 1992, Pablos-Mendez et al 1998, Espinal et al 2001, 2004; Negi et al 2003; WHO Report 2005, Menon S 2012)

acid and absolute alcohol for ten minutes (so they are known as Acid and alcohol Fast Bacilli, AFB).

3. Bacilli are sensitive to heat and killed at 60 deg. C in 15-20 minutes. Cultures may be killed by exposure to direct sunlight for 2 hours, but bacilli in sputum may remain alive for 20-30 hours. Bacilli may remain alive in droplet nuclei for 8-10 days. Culture remains viable for 6-8 months at room temperature and may be stored for two years in the deep freeze cabinet at –20 deg. C.
4. It is destroyed by tincture iodine in 5 minutes and 80% ethanol in 2-10 minutes.
5. During a 24 hours period, a patient may excrete as much as 4 billion bacilli in the sputum.
6. Bacilli have generation time of roughly 20 hours whereas most pathogenic organisms reproduce every 30 minutes.
7. It mainly affects the lung and one bacillus multiplies to 4096 bacilli in 12 days and 131072 in 17 days enough to produce a lung cavity.
8. Mycobacterium tuberculosis also develops resistance to antibiotics due to change in its drug sensitivity and virulence.

Drug Resistance

Every TB patient has million of tubercle bacilli. When the tubercle bacilli become resistant to one or more drugs, it is called drug resistance, i.e. the capacity of the bacilli to go on multiplying in the presence of drug at a concentration that could normally destroy or inhibit the growth of bacilli. The drug resistance is of three types:

1. *Primary or initial resistance:* when a person is infected by some one who has tubercle bacilli with acquired resistance to one or more drugs, i.e., when the patient with drug resistant TB bacilli infects other person, the tubercle bacilli which infect the other person are resistant to same drug even though the new patient has never taken those drugs in the past.
2. *Acquired or secondary resistance:* if the patient takes inappropriate treatment or irregular treatment, the TB bacilli become resistant to drugs. This is called acquired drug resistance. The main causes of this are – a) incorrect treatment with single Antitubercular drug; b) incomplete or inappropriate treatment; and c) irregularity in taking drugs.
3. *Multidrug resistant Tuberculosis:* it is defined as resistance to Isoniazid and Rifampicin with or without resistance to other antitubercular drugs. The prevalence of MDR was 1% to 3% and as high as 4.3% among all new cases (Zignol et al 2006) but it may be 13-17% in cases with a previous history of anti-TB treatment (Govt. of India 2007).

There were an estimated 440 000 new MDR-TB cases in 2008, and 150 000 deaths from MDR-TB. It was estimated that in 2009, 3.3% of all new TB cases had MDR-TB. In 2010, the largest WHO MDR-TB survey reported the highest rates ever of MDR-TB, with peaks of up to 28% of new TB cases in some settings of the former Soviet Union. Many countries have developed plans to address MDR-TB, but the response globally is still insufficient. The prevalence of MDRTB in Chandigarh and adjoining areas is as

high as 17 per cent. In new cases it was 9% and in previously treated cases it was 27% (Sethi et al 2013).
4. *Extensive Drug Resistant Tuberculosis:* XDR TB has been reported in nearly 90 countries and regions worldwide (WHO 2004). XDR TB is defined as MDR TB with further resistance to > 3 of 6 classes of second line drugs. It is found that 9.9% of the MDR TB cases are XDR TB (Sarita et al 2007). DOTS Plus which is handling MDR cases have serious threat from XDR TB. This need to be tackled through population based surveillance for second line drug susceptibility testing and improving compliance of patients in DOTS plus.

Predisposing Factors

Direct factors

- Diabetes mellitus
- HIV Infection
- Silicosis
- Close contact
- unimmunized child, for extrapulmonary TB
- Incompletely treated known open case of TB
- Patients on immunosuppressive therapy
- Lack of diagnostic and treatment facilities

Indirect factors

- Malnutrition
- Smoking
- Alcohol

Distant factors

- Lack of political commitment
- Poverty/low socioeconomic status
- Overcrowding
- War/Famine
- Illiteracy
- Stigma associated with TB
- Lack of community awareness
- Males more than 45 years of age are at higher risk of developing TB

Host factors

Constitutional: The risk is directly related to the family history of TB. Human leucocyte antigen (HLA) has been found to be responsible for determining susceptibility to disease like TB and Leprosy. People having DR2 gene in leukocytes were found to be more prone to TB.

Hormonal factors: Corticosteroids provoke activation of latent tubercular lesions and stimulate the rate of multiplication of bacilli. Hypothyroidism increases the susceptibility to disease. Person with uncontrolled diabetes mellitus also has more chance of developing the disease and also has poor prognosis.

Age: In very young age the child is vulnerable to develop most fatal form of disease such as tubercular meningitis, and miliary tuberculosis. Up to puberty the chances of primary, disseminated tuberculosis, and bone and joint tuberculosis is high. Pulmonary tuberculosis is common in adult age group of 15-45 years (Figure 9.2).

Sex: Both sexes are equally affected, however more male cases may come forward to consult health worker or doctor.

Race: There is no strong evidence of differences in racial preference.

Immunity: Low immunity makes the person susceptible to tuberculosis as seen in HIV infection. There are many factors which play a role such as malnutrition.

Socioeconomic factors: Poor socioeconomic status is linked with TB that could be due to existence of overcrowding, poor sanitation and malnutrition.

Personal factors: Tobacco smoking, alcoholism, and use of corticosteroids therapy also reduce the resistance against infection.

Psychological factors: Stress and strain of life, emotional trauma, drug addiction, alcoholism and other psychological factors are predisposing to disease.

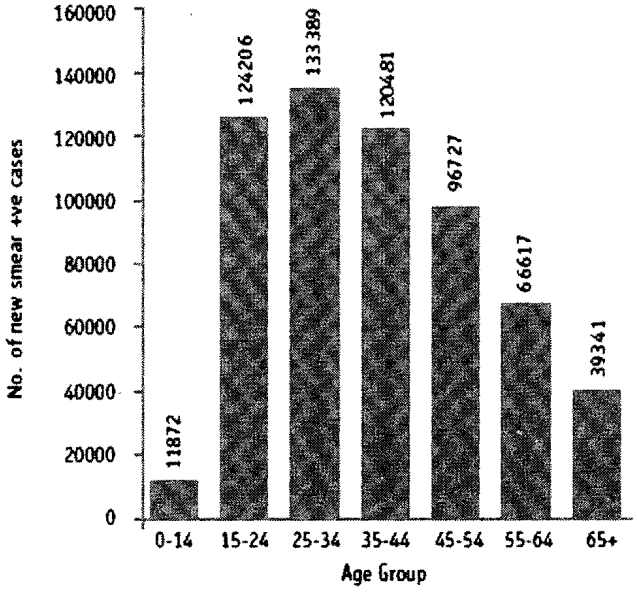


Fig 9.2: Agewise distribution of new positive case

Environmental Factors

Overcrowding and poor sanitation increase the chances of infection by close contact with an infectious case. Malnutrition and impairment of nutrition due to poverty, chronic alcoholism or gastric resection increases the susceptibility by lowering general resistance. Persons exposed to silica or working in close proximity with the patients are more prone to develop tuberculosis.

Transmission of infection

The source of infection for tuberculosis is a person with TB of the lungs who is coughing and is smear positive. Coughing produces tiny infectious droplets, which remain viable in air for a long time. Any susceptible individual who comes in contact and inhale these droplets, gets infection. Bacilli may remain dormant in tissues and persist for years without causing significant symptoms. Mycobacterium can also be transmitted through infected milk to intestine and cause intestinal tuberculosis.

Risk of infection

The risk of infection depends on the extent of exposure to droplet nuclei and susceptibility of the individual to infection. Therefore, the risk is high with close, prolonged, indoor exposure to a person with sputum smear-positive pulmonary tuberculosis. However, the risk of transmission of infection from a person with smear negative pulmonary tuberculosis is low and with extra-pulmonary tuberculosis it is much lower.

Risk of Progression of Infection to Disease

10% of all infected person can develop tuberculosis disease during their lifetime. The disease can affect any of the tissues and organ of the body. Without treatment, after 5 years, 50% of pulmonary tuberculosis patient will be dead, 25% will be healthy (due to strong immune defense) and 25% will remain ill with chronic, infectious TB. The chance of developing the disease is maximum shortly after infection and then steadily decreases as time goes by. Tuberculosis flourishes wherever there is poverty, overcrowding, malnutrition, silicosis and other lung diseases and various physical or emotional stresses. Poor sanitation and lack of health infrastructure in developing countries particularly in India has aggravated the problem. The most important trigger is weakening of immune resistance and HIV infection is an important cause of it. Therefore, HIV infection has increased the risk of developing active and resistant tuberculosis in latent cases. Mortality in such cases has also increased many folds.

Population Attributable Fraction-Risk factors for Progression to disease have been estimated by Lonnroth K et al 2010:

HIV	16%
Malnutrition	27%
Diabetes	10%
Alcohol use (>40g/d)	13%
Active Smoking	21%
Indoor Air Pollution	22%

CLINICAL FEATURES

In most cases primary infection is asymptomatic or detected by tuberculin testing. Only 5%-10% of the infected cases become symptomatic. Following primary infection, rapid progression to intrathoracic disease is more common in children than in adults. Chest X-ray may show intrathoracic lymphadenopathy and lung infiltrates. Post primary tuberculosis occurs only after a latent period of months or years after primary infection. It may occur either by reactivation or by reinfection. Post- primary tuberculosis most commonly involves lung. It also commonly involves pleura, lymphnodes, meninges, pericardium, ileocecal region, peritoneal cavity, spine, bones and joints. Less frequent involvement of male and female genital tract, kidney, adrenal glands, skins and other organs occurs. An active case of pulmonary tuberculosis is the most important component in disease spread within the community. For this reason the highest priority in TB control is the identification and cure of the infectious cases, i.e. patients with sputum smear positive pulmonary TB. Over 90% of these patients develops cough soon after onset of disease (WHO 1997). However, cough is not specific to Pulmonary TB as it could be due to smoking or any other respiratory illness.

Most of the other respiratory infections resolve within 2 weeks, therefore a cough of more than 2 weeks duration could be Pulmonary TB. Fever is more marked in mid-afternoon. Night sweats, weakness, fatigability, loss of appetite and weight are other symptoms of tuberculosis. When lung tissue is destroyed and bronchi are invaded, then there is productive cough or blood-streaked sputum or

hemoptysis. The patient also complains chest pain and breathlessness.

A person with extrapulmonary tuberculosis will present the symptoms and signs according to organ involved besides presenting symptoms stated above:

- Lymph nodes - swelling in the neck with or without discharging sinus.
- Joint – pain and swelling of joints if these are involved.
- Spine – pain and swelling in back.
- Meninges – headache, fever, drowsiness, mental confusion, and neck rigidity.

Diagnosis

The diagnosis of all forms of tuberculosis depends on identification or isolation of the causative organism. The demonstration of hypersensitivity to tubercular protein is of some diagnostic value. Tubercle bacillus is stained by Ziehl Neelsen technique. The patient may be identified on the basis of clinical symptoms because over 50% of the sputum-positive persons seek assistance at government medical institutions, motivated by their symptoms and confirmed by demonstration of Acid Fast bacilli in sputum or pus or FNAC specimen. X-rays chest is less reliable method because x-rays fail to detect 10-15% of culture-positive patients, and diagnose nearly 40% of patients as having TB who had negative cultures and likely did not have active TB (Toman K 1979). In recent finding it is found that two sputum smears are able to detect 98% of cases and third sputum sample does not yield significantly (Rao S 2009).

PREVENTION AND CONTROL OF TUBERCULOSIS

Medical Interventions

- Mainly chemotherapy, surgical intervention rarely required.
- Immunoprophylaxis-BCG.
- Chemoprophylaxis-isoniazid 5 mg/kg body weight daily for 6 months.
- Treatment of HIV-infected /AIDS cases.
- Strategies for prevention of HIV infection -as per NACO guidelines.
- Silicosis: Screen patients with silicosis once in 6 months and treat for TB when necessary.
- For extrapulmonary TB sometime surgery is required.

Non-Medical interventions

Exercise

- Lifestyle modification so that the incidence of diabetes mellitus (DM) could be reduced. DM increases the risk of active TB.
- Interventions to deal with alcoholism and smoking.

Nutrition

- Interventions to prevent, treat/reduce malnutrition, both in children and adults.

Others

- Health education for raising community awareness about TB, its treatment (that treatment has to be complete), about the role of BCG vaccination, etc.
- Interventions to reduce poverty and improve the economic condition of the people.
- Training.
- Incentives.
- Monitoring and evaluation.

National Policy

Tuberculosis has got high priority within the health sectors, as it is a major public health problem. The National Tuberculosis Control Program was started in 1962 but later it was included in Prime Minister's 20 points program. The Central Government supported the states financially on 50:50 basis but the Union territories and voluntary organizations were given 100% financial support. Implementation of the National TB Control Program is integrated with the Primary Health Care infrastructure of the country (GOI 1992). In 1993, WHO declared tuberculosis as a global emergency and adopted DOTS strategy for its control. In response to this, Indian government also revised the strategy. National Health Policy 2002 has supported the DOTS strategy under Revised National

Fig 9.3: TB Patient

Tuberculosis Control Program with the goal of reducing 50% mortality by the year 2010.

NATIONAL TB CONTROL PROGRAM

The National TB Control Program was started in 1962 with the aim to detect cases at the earliest and treat them. Later on, in the district, the program was implemented through the District Tuberculosis Center (DTC) and the Primary Health Care Institutions. The District Tuberculosis Program (DTP) was supported by the state level organization for the coordination and supervision of the program. This program was operational in most of the districts till it was replaced by DOTS strategy. The previous program strategies were as follows:

1. Early detection and treatment thereby converting infectious cases to noninfectious and preventing noninfectious cases from becoming infectious.
2. Diagnosis through radiology and sputum microscopy.
3. Free domiciliary treatment through Primary Health Care Services.
4. Establishing District Tuberculosis Center in every district.
5. Extend coverage under Short Course Chemotherapy (SCC)
6. Strengthen state TB training and Demonstration centers.

District TB Center (DTC): There were 446 districts that have DTCs. In addition to this there were another 330TB clinics functioning in major cities and towns of the country, which were equipped with laboratory and X-ray unit. Domiciliary treatment with INH and Thiacetazone was given for one year to one and half year. In same places short course daily regimen was also introduced. Other activities were case finding through house-to-house surveys, x-rays and sputum examination. BCG vaccinations became the part of Universal Immunization Program.

TB Training and Demonstration Center: In each major state of the country there was a provision of establishing one TB Training and Demonstration Center for providing basic training to paramedical personnel for example, TB Health Visitors, Lab. Technician etc., and training of general practitioners and over all supervision of functioning of TB Control Program of the state. At present around 16 such centers are working in the country.

TB Beds: There were about 47,600 beds available for the treatment of serious TB patients who needed indoor care but were not sufficient to take care of all patients.

Training: National TB Institute, Bangalore and LRS Institute of TB & Respiratory Diseases, New Delhi were regularly conducting international and national training courses for medical and paramedical workers.

Information Education Communication (IEC): This had been an important area of national program where sufficient input was not given. Detailed IEC strategy has been formulated in revised program.

Research Activities: National TB Institute, Bangalore, TB Research Center, Chennai, and LRS TB Institute of TB and Respiratory Diseases, New Delhi have been actively involved in research at the national and international level. Many famous treatment trials for example, domiciliary treatment trial of TRC Madras are world famous for providing treatment at home.

Monitoring and Review: Data on case finding and treatment at the village and primary health center level used to be generated and passed through the district to the state level and thence to the center level (DGHS). The program used to be reviewed at Center, by the Secretary (Health) and Director General Health Services, at the State level, by State Director of TB Training and Demonstration Center and at the District level it used to be reviewed by District Tuberculosis Officer (DTO)/District Medical Officer.

Need for Revised Strategy

In 1992, a nation wide review was conducted with the assistance of SIDA and WHO (GOI 1992). With the help of many other evaluation studies (Datta 1993, Gothi 1997, Bedi 1997, Suryanarayan 1995) it was observed that the program has not made any improvement in the disease status. Following reasons for failure of National Tuberculosis Control Program (NTP) were highlighted in the evaluation report:

1. Completion rate of treatment was 30% only;
2. Inadequate Budgetary outlay;
3. Shortage and irregular supply of antitubercular drugs;
4. Undue emphasis on X-rays diagnosis;
5. Poor quality of sputum microscopy;
6. More emphasis on case detection rather than cure;
7. Poor organizational setup and support for tuberculosis;

8. Multiplicity of treatment regimens;
9. Poor acceptability of principles of integration of NTP into general health services, and resistance from medical fraternity; and
10. Poor awareness of TB patients about the disease causation, prevention, duration of treatment, and availability of TB treatment in general hospital.
11. Non-availability of trained staff.

Based on these findings strategy for the program was revised and objectives were set. The priority for treatment is individuals with pulmonary tuberculosis with positive sputum smear, as they are the main sources of infection and have a higher risk of mortality. Based on many clinical and community trials (TCC 1973, HKCS 1976, 76, 91) it is accepted that short course, twice and thrice weekly intermittent regimen is as effective as daily regimens. Effectiveness of DOTS has been demonstrated worldwide. China has already claimed for 90% cure rates of TB cases among 650 million people where DOTS is implemented. Similar results have been observed in Vietnam and Cambodia. In India, the pilot projects covering a population of 13.85 million have demonstrated a cure rate of about 80%. The main advantage of intermittent chemotherapy over daily chemotherapy is that it is practicable to administer under full supervision and thereby eliminate irregularity. DOTS is also effective in HIV infected/ AIDS patients (Alpert et al 1997, Alwood et al 1994). According to WHO recommended DOTS strategy (Directly Observed Treatment Short Course), Govt. of India designed the program strategy in 1997 with the support of World Bank. The differences in old NTP and Revised program are given in Table 9.4.

REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAM

Objectives of RNTCP

1. Emphasis on the cure of infectious and seriously ill patients of tuberculosis, through administration of supervised Short Course Chemotherapy, to achieve a cure rate of at least 85%.
2. Augmentation of the case finding activities to detect 70% of estimated cases, only after having achieved the desired cure rate.

Revised Strategy

1. Augmentation of organizational support at Central and State levels for meaningful coordination.
2. Increased budgetary outlay.
3. Use of sputum testing as the primary method of diagnosis among self-reporting patients.
4. Standardized treatment regimens.
5. Augmentation of the peripheral level supervision through the creation of a subdistrict supervisory unit.
6. Ensuring a regular, uninterrupted supply of drugs up to the most peripheral level.
7. Emphasis on training, IEC, Operational research and NGO involvement in the program.

Interventions

To ensure a systematic and speedy introduction of Revised NTCP without sacrificing quality control, a

Table 9.4: Difference in National Tuberculosis Program (NTP) and Revised NTCP

	NTP	RNTCP
Objective	Early diagnosis &Treatment	Breaking the chain of transmission
Operational Targets	1. Not defined	1. Cure rate 85% 2. Case finding 70% of estimated cases
Strategy	1. SCC unsupervised 2. Conventional: Long term domicillary treatment with INH + Thiacetazone	1. DOTS (Directly Observed Treatment Short Course Chemotherapy) 2. Uninterrupted drug supply
Diagnosis	1. More emphasis on X-rays 2. 2 sputum smears 3. One sputum positive is considered a case	1. Mainly sputum microscopy 2. Two sputum smears 3. One smear positive/clinically positive is a case

series of interventions are being introduced that have modified the functioning of the entire National Tuberculosis Control Program. These are as follows:

i) Strengthening of the TB cells at the Central and State levels.
ii) Strengthening of the Training Institutions for Tuberculosis at the central and state level.
iii) Gradual implementation of the revised strategy for TB control covering a population.
vi) Strengthening of the National Tuberculosis Control Program in remaining Short Course Chemotherapy districts as transitional step to adopt the RNTCP.
v) Providing for an uninterrupted supply of anti-TB drugs (Both SCC and Conventional) for sputum positive patients throughout the country.

Important Working Definitions accepted in RNTCP

Case (New): A patient who is suffering from TB and never had treatment for tuberculosis or has taken antituberculous drugs for less than one month.

Case (Pulmonary), Smear positive TB: in patient one initial sputum smear examinations (direct smear microscopy) positive for AFB.

Or: TB in a patient with culture positive for M. Tuberculosis.

Case (Pulmonary), smear negative TB: in a patient with symptoms suggestive of TB with at least 2 sputum examinations negative for AFB, and radiographic abnormalities consistent with active pulmonary TB as determined by a medical officer, followed by a decision to treat the patient with full course of antituberculosis therapy.

Or: Diagnosis based on clinical examination and he/she is culture and AFB sputum examination negative.

Chronic case: A patient who remains smear-positive after completing a retreatment regimen.

Cured: Initially smear-positive patient who has completed treatment and had negative sputum smears, on at least two occasions, one of which was at completion of treatment. **Cured** in case of An MDR-TB patient who has completed treatment and has been consistently culture negative (with at least 5 consecutive negative results in the last 12 to 15 months). If one follow-up positive culture is reported during the last three quarters, patient will still be considered cured provided this positive culture is followed by at least 3 consecutive negative cultures, taken at least 30 days apart, provided that there is clinical evidence of improvement.

Defaulted: A patient who, at any time after registration, has not taken anti-TB drugs for 2 months or more consecutively.

Died: Patient who died during treatment, regardless of cause.

Extrapulmonary tuberculosis: TB of organs other than lungs, such as the pleura (TB pleurisy), lymph nodes, abdomen, genitourinary tract, skin, joints and bones, tubercular meningitis, tuberculoma of the brain, etc.

Note: A patient diagnosed with both pulmonary and extra-pulmonary TB should be classified as a case of pulmonary TB.

Failure: Smear-positive patient who is smear positive at 5 months or more after starting treatment. Failure also includes a patient who was initially smear negative but who becomes smear positive during treatment.

"Other" case: Patients who do not fit into the mentioned categories. Reasons for putting a patient in this category must be specified.

Relapse: A patient declared cured of TB by a physician, but who reports back to the health service and is found to be bacteriologically positive.

Treatment after default: A patient who received Anti-Tuberculosis treatment for one month or more from any source and who returns to treatment after having defaulted, i.e., not taken anti-TB drugs consecutively for two months or more.

Transferred in: A patient who has been received into a Tuberculosis Unit/district (TU), after starting treatment in another unit where she/he has been recorded.

Transfer out: A patient who has been transferred to another Tuberculosis Units/District and his / her treatment results are not known.

Treatment completed: Sputum smear-positive case that has completed treatment, with negative smears at the end of the initiation phase but none at the end of treatment.

Or: Sputum smear-negative patient who has received a full course of treatment and has not become smear-positive during or at the end of treatment.

Or: Extrapulmonary patient who has received a full course of treatment and has not become smear-positive during or at the end of treatment.

Tuberculous infection: may be defined as the presence of viable but not multiplying virulent tubercular bacilli within the cells of the human being without any manifestation of clinical symptoms.

Tuberculous disease: may be defined as the presence of viable, multiplying, virulent tubercular bacilli within the cells or tissues, with the presence of clinical symptoms.

New WHO Stop TB Strategy

The new WHO Stop TB Strategy, released in 2006 has identified six principal components to realize the global TB-related MDGs by 2015. This has been discussed in detail later on.

RNTCP Phase II

The RNTCP Phase II has emphasized on following:

- To strengthen the quality of DOTS through implementation of the RNTCP quality assurance protocol for sputum microscopy;
- Decentralized accessible and patient friendly DOTS services;
- Proactive Public-Private Mix (PPM) activities to increase the reach of DOTS services;
- Rational use of standardized first and second line anti-TB drugs; and
- Need based advocacy communication and social mobilization to generate awareness and demand for quality services.

The aim of second phase RNTCP is to consolidate, maintain and further improve the achievements of the first phase. The main focus is on quality of services. An enabling patient-friendly environment is to be provided in whichever health care facility they seek care. This is envisaged to be achieved through scaling up of inter-sectoral collaboration, e.g., medical college, NGOs, private sector, health facilities under other ministries, etc. RNTCP is also working to maintain services for marginalized groups such as urban slum dwellers and tribals in terms of improved access to health facilities. Needbased, focused and people centric IEC activities have been regularly organized especially for such people living in hard-to-reach areas.

COMPONENTS OF DOTS

DOTS has following components (Figure 9.5):

1. Case Detection with the help of microscopy with a system of multi-tier cross-checking and quality assurance of sputum smear.
2. Regular and uninterrupted supply of drugs: *Patient-wise boxes*
3. Direct Observation while patient is getting chemotherapy by the health worker or community volunteers.
4. Systematic evaluation and monitoring to ensure cure.
5. Political and administrative Commitment to ensure financial support and sustainability.

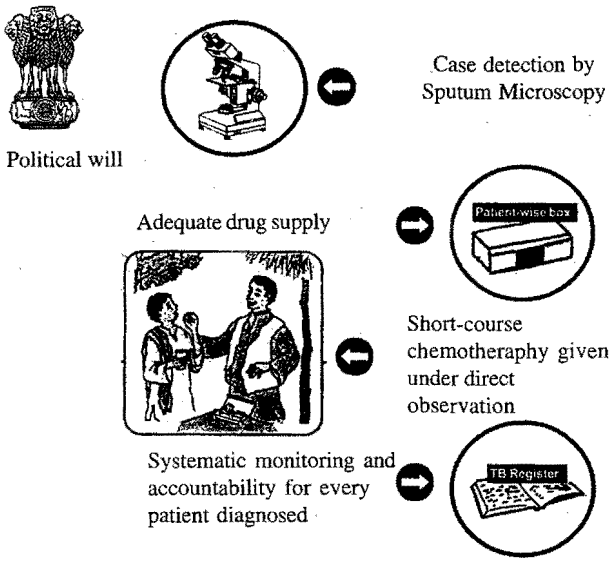

Political will
Case detection by Sputum Microscopy
Adequate drug supply
Patient-wise box
Short-course chemotheraphy given under direct observation
Systematic monitoring and accountability for every patient diagnosed
TB Register

Figure 9.5: Components of DOTS

Diagnosis

There are two basic approaches for the diagnosis of tuberculosis-direct and indirect (Kandi & Madhavi 2010):

A. Direct Methods

Sputum Examination

A patient who is reporting to the health facilities, his/her 2 samples of sputum will be examined under microscope if his / her symptoms are suggestive of TB. Two sputum samples can be collected on a single day or collected on two days: one on spot and another on early morning.

Spot: Clinical symptoms are easy to determine and a health worker can pick up such suspects from the community while going for field visit. Lady health visitor/health supervisor can verify such symptoms in her/his visits and refer them to microscopy center or

ask for 2 samples of sputum. (S)he can demonstrate how to bring out sputum.

Early Morning Sample: patient is given labeled sputum container and asked to give the sample of the first early morning cough (as secretion get collected in the airway overnight and therefore sputum is more likely to be positive).

Technique for sputum collection
The best procedure of coughing out sputum is involving series of actions:

i) inhaling deeply 2-3 times;
ii) cough out deeply from the chest;
iii) open the container, bring it close to the mouth and bring the sputum out into it;
iv) no saliva or nasal secretion should be given; and close the container.
v) This procedure should be carried out in an open space and no one should be standing in front of the patient. Switch off fans and open window.
vi) Instruct patient to empty bowel and bladder before starting.

If the health facility is a Designated Microscopy center (DMC) one spot specimen is collected immediately on the first day and patient is given a sputum container with instructions for collection of an early morning specimen which is brought to the DMC by the patient/ attendant on the second day. If the health facility is not a DMC then the patient is given a sputum container with instructions to collect an early morning specimen and go with the sputum specimen to the DMC where the spot specimen can be collected. In case the patient is not able to travel to the DMC then both the morning and the spot specimens could be collected at the nearest health facility or sputum collection centre and transported to the DMC. Results of sputum tests should be reported within a day.

Advantage of sputum microscopy

- It is more reliable diagnostic tool than x-rays for the diagnosis of infectious TB.
- It is simple to perform.
- Minimal infrastructure required to set up a microscopy center as compare to x-rays or culture laboratory.
- It is inexpensive as compared to other diagnostic test.
- It gives quick results.
- It is necessary to monitor patient progress and declare patient as "cured".

Zeihl Neelsen Staining
The sputum smear is dried and fixed. The smear is covered with carbol fushin and gently heated by steaming, for 5-7 minutes, without letting the stain to boil and become dry. The slide is then washed with water and decolorized with 25% sulphuric acid till no more stain comes off and then with 95% ethanol for two minutes. Decolorization may also be carried out as a single step with acid alcohol (3% HCl in 95% ethanol). After washing, the smear is counterstained with 0.1% Loeffler's methylene blue (Most commonly used), or 1% picric acid or 0.2% malachite green for one minute. Under the oil immersion objective lens of microscope, acid-fast bacilli are seen as bright red rods while background is blue or yellow or green dependent on the counterstain used.
Result: At least 100 fields should be examined before giving the result. Smears have been graded depending on the number of bacilli seen:

1+ when 3-9 bacilli are seen in the entire smear,
2+ when 10 or more bacilli are seen in the smear, and
3+ when 10 or more bacilli are seen in most oil emersion fields.

Disadvantage:

1) At least 10,000 acid-fast bacilli per ml of sputum should be present to give positive result;
2) False positive results could be due to presence of saprophytic species present in tap water. Similarly rubber tubes, cork, and bark present in stain or on slide can also give false results.

One specimen positive out of the two is enough to declare a patient as smear positive TB.

Culture
Traditionally cultures are very sensitive for detection of tubercle bacilli and may be positive with as few as 10-100 bacilli per ml of sputum. Up to 30-50% of smear negative cases can be diagnosed if culture are done. But routine culture is expensive and time consuming. Sputum is inoculated into at least two bottles of IUAT-LJ medium (Lowenstein-Jensen) or the middlebrook 7H10 or 7H11 media. If the specimen is positive by

microscopy, a direct drug sensitivity test may be set up. Cultures are examined for growth after incubation at 37^0C for four days and at least twice weekly thereafter. A negative report is given if no growth appears after 8-12 weeks. Smears from colonies that develop are stained by the Ziehl-Neelsen method and examined.

Rapid Methods (Microculture methods)

BACTEC

This is a rapid culturing method but expensive and not readily available. Bactec radiometric culture system which can detect mycobacterium as early as 7 – 14 days on the basis of release of radio labeled CO2 from growth of mycobacterium in selective liquid media using C14 labelled substrate with a sensitivity of almost 95%. Bactec system is a good system for level II laboratories especially in the diagnosis of extrapulmonary and smear negative tuberculosis (Rodrigues et al 2007).

Other rapid methods

Micro colony detection on solid media, microscopic observation of broth culture (Liquid media), Mycobacterium Growth Indicator Tube (MGIT) 960 method, MB/BacT system, ESP Culture system II, Septi-Check AFB method, TK Medium.

Molecular amplification methods

Polymerase Chain Reaction: This test comprises amplification of target nucleic acid enzymatically by polymerase chain reaction and then using nucleic acid probes for specific detection and identification. The test may detect positive signals from 1-10 bacilli in specimens tested, within a day. The test requires high level of standardization and in the developing countries it is readily available.

Phenotypic methods-Phase based assays: uses mycobacteriophages to infect live M tuberculosis and detect the bacilli using a phage amplification of phages after their infection of M tuberculosis, followed by detection of progeny phases as plaques on a lawn of M smegmatis.

B. Indirect Methods

Antibody Detection by TB STAT-PAK: This is a immunochromatographic blood test.

ELISA Test: This test for antigen (usually A 60 antigen) - which is a serological test to detect specific antibody response in TB patients by using specific antigens. The antigens currently available are neither sufficiently specific nor sensitive and value of the test is similar to tuberculin test. Nevertheless, the ELISA test has a supportive value mainly for the diagnosis of extra-pulmonary disease.

Restriction Fragment Length Polymorphism (RFPL): This test combines southern blotting with hybridization with specific DNA probes to produce characteristics band pattern (DNA finger prints) that are specific for each organism.

FTB (Fast Plaque TB): FTB is a site specific and can be performed on sputum, aspirates, pus, blood, etc. It can detect viable bacilli indicating active infection. It is comparable with cultural and results are obtained within 48-72 hours. Its sensitivity is 90% and specificity is 100%.

QTB-G (Quantiferon TB Gold): QTB-G can be applied on blood sample and it is not affected by prior BCG vaccination so has greater sensitivity. The results are obtained within 3-5 days.

Tuberculin Test

Tuberculin test is the tool for detecting TB infection. It is the test to know whether the person is infected with tubercle bacilli or not. The test does not give any idea whether the individual is currently suffering from disease or not, since infection may not always lead to disease.

Principle of tuberculin test: Robert Koch who discovered tubercular bacilli on experiment showed that the body reacts differently in the first and subsequent infection. He conducted the experiment on the guinea pig by injecting the tubercle bacilli on the thigh. Initial there was no reaction for 7-10 days but later on there was swelling at the site of injection which formed ulcer after 3-4 weeks and the glands of the groin got swollen. After six weeks, he again injected the tubercle bacilli in the thigh of guinea pig. This time, the reaction was quick. The site of injection swelled within 48 hours and ulcer formation took place after 3-4 days, which got healed within 4 weeks

whereas the ulcer of the first infection did not heal at all.

With this experiment he proved that reaction of first infection is different from subsequent infection. In the first infection the reaction is slow because the body has no allergy, the bacilli continue to grow and reach glands, as antibodies have not yet formed in the body, which can kill the germs. After the first infection the body develops immunity by producing antibodies against the tubercle bacilli. Thus by watching the reaction to infection, we can know that person is having infection or not.

Tuberculin: is the purified protein derivatives (PPD) extract of the human strain of dead tubercle bacilli, which is obtained by heating the bacilli in the medium in which they were made to grow. It is just a component of bacilli and cannot cause disease on inoculation. PPD contains RT23 and Tween 80 (tween 80 is a detergent to prevent the tuberculin sticking to glass). Tuberculin is measured in the form of tuberculin unit.
1 TU = 1/50,000 mg protein part of tubercle bacilli.
1 ml = 0.002 mg of protein part of tubercle bacilli.
And 0.1 ml = 0.0002 mg of PPD

Mantoux test: is performed by introducing Purified Protein derivatives (PPD) in the intradermal layer of the skin.
Procedure: Tuberculin test is performed by introducing 0.1 ml of TU of PPD intradermally on flexor surface of left forearm approximately midway between the elbow and the wrist. Although the test can be done on any surface area of the body but due to uniform international acceptance of site the left forearm is preferred. Steps for performing Mantoux test are as follows:

1. Wash hands thoroughly with soap and water;
2. Always check the vial and read its label;
3. Confirm the authorization of manufacturer;
4. Check the expiry date;
5. Check the vial was stored at 2 to 8 deg. C temperature in the refrigerator.
6. Before giving the injection, check for BCG scar on the left shoulder;
7. Check whether the prescription of the patient, name, age and referring doctor name;
8. Always give the injection on the flexor surface of the left forearm. In case of contraindication, mention it on the prescription, why right arm or some other area is chosen.
9. Maintain sterile technique.
10. Preparation of site not required (don't use antiseptics).
11. Take the complete dose; hold the needle parallel to the skin, with the bevel of needle facing upward.
12. Instruct patient not to rub, scratch or use antiseptic creams or soaps at the site.
13. Write the date and the dose used on the slip.
14. Reading noted must be written as PPD 1 TU reading =_____ mm.

Reading of test results: Mantoux test is read between 48 hours to 96 hours however, 72 hours is the ideal time. Before 48 hours and after 96 hours reading is not reliable. The test is read in the horizontal diameter of the swelling (induration or hardness) at the site of injection ignoring redness.

Positive result: Tuberculin test is positive if induration is more than 15 mm (BCG vaccinated) and more than 10 mm (BCG not vaccinated). A positive tuberculin test does not necessary signify the presence of active disease and should always be correlated with the clinical features and result of other diagnostic procedure.
Following conditions may give rise to Positive (5 mm or more) results:

a) HIV positive person;
b) Recent contacts of active tuberculosis cases;
c) Persons with nodular or fibrotic changes on chest x-rays consistent with old healed TB;
d) Organ transplant recipients and other immunosuppressive patients who are on cytotoxic immune-suppressive agents such as cyclophosphamide or methotrexate
e) Patients on long term systemic corticosteroid therapy (> than six weeks) and those on a dose of prednisone ≥15 mg/day or equivalent
f) End stage renal disease

Following condition will give positive (10 mm or more) results:

a) Recent arrivals (less than five years) from high prevalence countries
b) Injectable drug users

c) Resident and employees of high risk congregate settings (prisons, nursing homes, hospital, homelss shelters, etc).
d) Mycobacterial lab personal
e) Persons with clinical conditions that place them at high risk (e.g. diabetes, prolong corticosteroid therapy, leukemia, end-stage renal disease, chronic malabsorption syndromes, low body weight, etc.)
f) Children less than 4 years of age, or children and adolescent exposed to adults in high risk categories.
g) Infants, children and adolescents exposed to adults in high risk cateogories.

Conditions where positive (15mm or more) results:
a) Persons with no known risk factors for TB. Reactions larger than 15 mm are unlikely to be due to revious BCG vaccination or exposure to environmental mycobacterium.

False Positive results
Some persons may react to the TST even though they are not infected with M tuberculosis. The causes of these false-positive reactions may include, but are not limited to the following:
a) Infection with non tuberculous mycobacteria.
b) Previous BCG vaccination.
c) Incorrect method or tuberculin test administration
d) Incorrect interpretation of reaction
e) Incorrect bottle of antigen used.

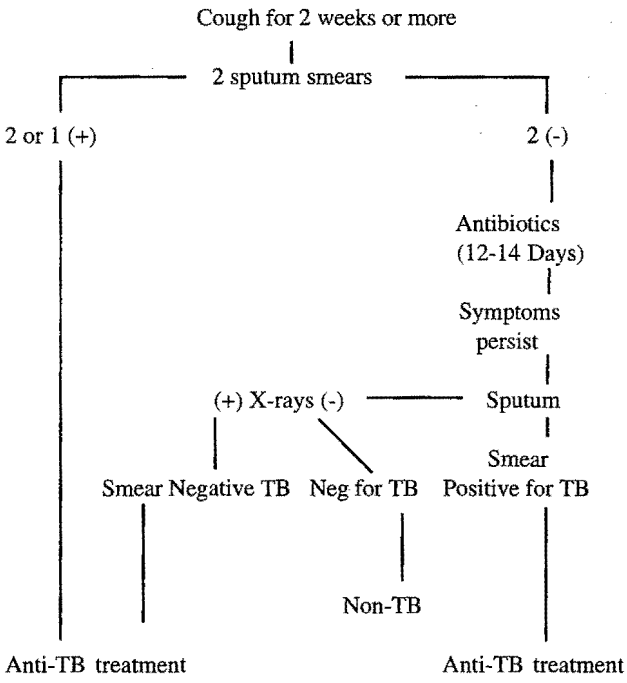
Negative result: if induration is less than 10 mm it is considered to be negative. Sometimes following conditions may give false negative result:
a) Pre allergic phase – whenever tubercle bacilli enter the body, the primary complex is formed after 6 weeks. During that phase, allergy has not developed in the body. If tuberculin test is done during that phase, the test would show negative result.
b) Recent TB infection (within 8-10 weeks of exposure)
c) Very old TB infection (many years)
e) High fever.
d) Measles and chicken pox.
e) Recent live virus vaccination (e.g., measles and small pox)
f) Whooping cough.
g) Malnutrition.
h) HIV and AIDS
i) Use of anti-allergic drugs.
j) Immuno suppressive drugs including steroids.

Significance of Mantoux test: In children below 5 years if Mantoux test is positive, further investigations are required to make the diagnosis. In case TB is confirmed, full treatment of TB should be given to the child. The test is positive but TB could not be confirmed, then chemoprophylaxis is given to the child. In case of negative Mantoux test, BCG can be given to the child.

Sensitivity Tests
In this a number of culture media containing serial concentrations of the Antitubercular drug are inoculated and the minimum inhibitory concentration calculated from the medium with the least drug concentration that inhibits growth. Similarly various drugs such as INH, Rifampicin, etc., are placed on culture media and inoculated with concentrated sample of patients' sputum. If growth appear in any of the culture media this indicate that bacilli is resistant to that drug and where growth does not appear, the drug can successfully prevent the growth and bacilli are sensitive to that drug.

Diagnosis under Revised Strategy
Patients in whom both specimens are smear-negative should be prescribed symptomatic treatment and broad-spectrum antibiotics for 10 - 14 days. In such cases antibiotics such as fluoroquinolones (ciprofloxacin, ofloxacin, etc.), rifampicin or streptomycin, which are active against tuberculosis, should not to be used. Most patients are likely to improve with antibiotics if they are not suffering from TB. If the symptoms persist after a course of broad spectrum antibiotics, repeat sputum smear examination (2 samples) must be done for such patients. If one or more smears are positive, the patient is diagnosed as having smear-positive pulmonary TB. If none of the repeat sputum specimens is positive, a chest X-ray is taken, and if findings of the X-ray are consistent with pulmonary tuberculosis, the patient is diagnosed by the physician as a case of sputum negative pulmonary TB (Fig.9.6). In case of child if the Mantoux test and X-rays are suggestive of TB, then can be treated as smear negative TB. If X-rays and Mantoux test is negative and symptoms persist it is better to refer the child to pediatrician.

Figure: 9.6: Diagnosis of a tuberculosis



Case Detection through Quality Assured Microscopy

A nationwide network of RNTCP quality assured designated sputum smear microscopy laboratories are being envisaged, which provide appropriate, available, affordable and accessible quality assured diagnostic services for TB suspects and cases. To meet the standards of internationally recommended diagnostic practices for TB, the program provides the supply of quality reagents and equipment to the laboratory network (Fig 9.7).

To ensure quality of diagnosis, each district should implement 'on-site evaluation' and 'random blinded rechecking' for all DMCs in the district. In addition, each district needs to undergo at least one 'panel testing' and one 'on-site evaluation' by the Intermediate Reference Laboratory. It is the responsibility of the State TB Offices (STOs), District TB Officers (DTOs) and the IRLs to ensure that External Quality Assessment (EQA) is maintained across all DMCs under their jurisdiction. There are three national level laboratories namely, Tuberculosis Research Center Chennai; National Tuberculosis Institute, Bangalore; and National Institute of Tuberculosis & Respiratory Diseases Delhi. JALMA Institute of Leprosy & Other Mycobacterial Diseases is also National Regional Laboratory (NRL). The state level Intermediate Reference Laboratories (IRLs) suppose to provide support to microscopic centers and it is planned to have 24 state level IRLs by 2010-2011 for undertaking Culture and Drug Sensitivity Test and conducting Drug Resistance Surveillance in selected areas and about 12,000 designated microscopy centers (DMCs).

Effective Drug Supply and Management System – Procurement Issues

Supplies of first line anti-TB drugs are being acquired through the Global TB Drug Facility (GDF) utilizing financial support of the UK's Department for International Development (DFID), procured by WHO through Global Drug Facility (GDF), utilizing USAID support, and World Bank under Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM). Post Procurement Reviews of all contracts below "prior review threshold levels" at the Central and State levels is being done every quarter by an independent Consultant appointed by the World Bank. The Central TB Division (CTD) is monitoring the reports of such reviews and asks for action taken on these reports from the concerned states. Guidelines are given for drug stocking norms and calculation of drug requirement.

Based on the investigations (figure 9.6) patients are put in following categories for the treatment (Table 9.5). For treatment each patient should be categorized according to his/her sputum smear report and clinical findings mainly but chest X-ray report may also be considered in some cases.

Category I (New Cases)

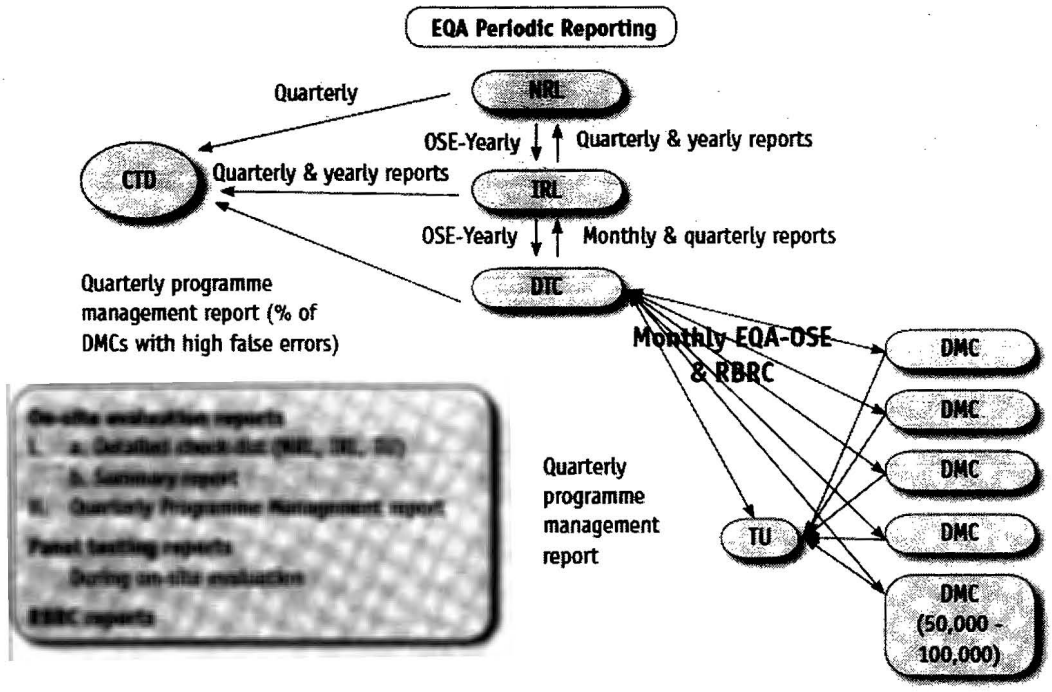
Color of the Box for Category I: Red

Type of patients: New cases of AFB smear positive pulmonary TB and other newly diagnosed sputum-negative seriously ill patients with severe forms of tuberculosis. This category is also include new cases of AFB smear-negative pulmonary and extra-pulmonary TB who are not very seriously ill.

Priority: Highest

Regimens: Intensive phase: 2 (HRZE)3, i.e., isoniazid, rifampicin, pyrazinamide, and ethambutol in a blister pack, administered three times a week for 2 months under supervision of the health staff or reliable observer (DOTS provider). When the patient has

Figure 9.7: Reporting procedure



Abreviation: NRL: National Reference Laboratory; IRL: Intermediate Reference Laboratory; DTC: District TB Center; DMC: District Microscopy Center; RBRC: Random Blinded Re-checking

completed the intensive phase of 2 month and the sputum smear is negative for AFB, the continuation phase will start. If sputum smear is positive at 2 months, the intensive phase of 4 drugs is continued for another one month, after which the continuation phase is started, regardless of the results of sputum smear examinations.

Continuation phase: 4 (HR)3, i.e, isoniazid and rifampicin are given three times a week for 4 months. For patients with tubercular meningitis, disseminated TB or spinal disease with neurological complications these two drugs should be given for 6 to 7 months. Blisters of two drugs are collected weekly and first dose of the week should be taken in front of health care worker or reliable observer. Rest two doses are taken by the patient himself/herself. At the next visit empty blister is returned to the DOTS provider.

If the patient remains sputum-positive at 3 months after start of intensive phase, the patient is put on the continuation phase of treatment. The next sputum is repeated after 2 months of continuation phase, i.e, month 5 of the beginning of treatment. If the sputum is still positive for the AFB the patient is categorized as a case of failure of treatment and started on the re-treatment regimen afresh. If the patient has negative sputum smear at 2 months but a positive smear at 4 months, sputum smear should be done again at 5 months. It the smear is positive at 5 months, the patient should be declared a failure of treatment and should be reregistered and started as a fresh case on the category II regimen.

Category II (Retreatment Cases)

Color of the Box for Category II: Blue

Type of patients: who have received antitubercular treatment for more than one month in the past. They are therefore at an increased risk of having multi-drug resistant disease. These include smear-positive relapses, smear-positive failure cases, and smear-positive patients being treated after default.

Priority: Highest

Regimen: Intensive phase: 2 (HRZES)3 /1 (HRZE)3, i.e., rifampicin combined with isoniazid, pyrazinamide and ethambutol, supplemented with streptomycin for the first 2 months, followed by the same drugs without streptomycin for 1 month given three times a week available in blister pack taken in front of DOTS

Table 9.5: Classification of categories, types of patients, regimens adopted under RNTCP

Category	Type of patient		
New Cases	New sputum smear Positive	$2(HRZE)_3$@ $4(HR)_3$	6
	Seriously ill sputum negative Seriously ill extra-pulmonary** Sputum negative Extrapulmonary not seriously ill		
Retreatment Cases	Sputum positive relapse***	$2(HRZES)_3$ $1(HRZE)_3$#	8
	Sputum positive failure*** Sputum positive treatment after default	$5(HRE)_3$	
MDR-TB cases##		[6(9) K O Et C Z E / 18 O Et C E]	24-27

! All the drugs are administered thrice weekly. The number before the letters refers to the number of months of treatment. The abbreviations are as follows: R-Rifampicin, E-Ethambutol, H-INH, S-Streptomycin, and Z-Pyrazinamide, K-Kanamycin, O-Oflaxacine, Et-Ethionamide, C-Cycloserine.

*** Examples of seriously ill extrapulmonary TB cases are meningitis, disseminated TB, tuberculous pericarditis, peritonitis, bilateral or extensive pleurisy, spinal disease with neurological complaints, smear negative pulmonary TB with extensive parenchymal involvement, and intestinal and genitourinary TB.*

@ If Sputum smear is positive after 2 months of the start of treatment then same treatment regimen (Intensive phase) should be continued for another one month. Thereafter continuation phase should be started irrespective of sputum report at 3 month. If patient is sputum positive at 5 months also then he/she should be labeled as "failure" and category II treatment should be started from the beginning.

**** In rare and exceptional cases, patients who are sputum smear-negative or who have extrapulmonary disease can have relapse or failure. This diagnosis in all such cases should always be made by a medical officer and should be supported by culture or histological evidence of current active tuberculosis. In these cases, the patient should be categorized as "other" and given category II treatment.*

 # If the Sputum smear is positive even after 3 months of the start of treatment in category II patients then four drugs $(HRZE)_3$ excluding streptomycin, should be extended for one more month.

##Smear examination should be conducted monthly during IP and at least quarterly during CP; Culture examination should be done at least at 4, 6, 12, 18 and 24 months of treatment

provider. If the sputum is smear-negative for AFB at 3 months, the continuation phase is started. If the sputum smear is positive at 3 months, the 4 oral drugs are continued for another months. If the sputum is still positive at the end of the 4th month and facilities for culture are available, the sputum should be sent for culture and sensitivity after stoppage of the drugs for 3 days. Regardless of the availability of culture facilities, the patient should start the continuation phase after the 4th months.

Continuation phase: 5 (HRE)3, i.e., 5 months of Isoniazid, rifampicin and ethambutol three times a week. If the patient remains smear-positive after completion of the continuation phase he/she is no longer eligible for the retreatment regimen. The patient is managed as a chronic case. Such case can be referred to tertiary or special TB hospitals.

Treatment after default: if the patient is smear-positive while restarting treatment, he/she is put on the retreatment regimen given above. If the sputum is smear-negative for AFB, he/she should be given a course of antibiotics. If he/she does not respond a chest X-ray is to be taken. If on the basis of clinical and radiological examination the doctor feels that the patient is suffering from pulmonary TB, then the patient should complete the course of treatment he was on prior to default.

Chronic cases: Cases that remain smear-positive after completing the retreatment regimen are classified as chronic cases. They are the priority case for DOTS Plus. They may be resistant to one drug /multi-drugs and should be referred to specialty hospital where DOTS Plus is provided.

During intensive phase, medicines are to be taken thrice weekly on alternate days. If a patient does not receive treatment on the scheduled day, health worker should go to the patient's house and call him to treatment on that day or the following day. But the next dose should be given as scheduled. The drugs are available in blister combipack in specified doses, which need not to be modified if the weight of the adult patient is 60 Kg. or less. Table 9.6, shows the number of pills with doses in adult and children patients. Around 8.4% of the DOTS patients report side effects, which are mainly related to gastrointestinal and nervous system and skin (Dhingra 2004) (Table 9.7).

Note: Daily regimen is also approved by the government. Duration would be same.

Follow up

New Smear positive patients: Two smears are examined each time for follow up. The first sputum smear examination is done at two months, after the intensive phase of treatment. If smear is found negative then patient is put on continuation phase. If smear is positive, then intensive phase treatment is continued for another month. After one month another sputum smear examination is done but the patient is put on continuation phase irrespective of sputum finding. Subsequent follow up smear examinations is done at two months of the continuation phase and if positive, the patient is declared as a treatment failure, reregistered and put on a retreatment regimen afresh.

Re-treatment patients: Two smears are examined each time for follow up. The first sputum smear is done at three months, after the intensive phase of treatment. If negative, then patient is put on continuation phase. But if smear is positive, then intensive phase treatment is continued for one more month. One more smear examination is done at the end of one month and put on continuation phase of 4 months, irrespective of result of this sputum smear. In continuation phase, sputum smears are examined twice; one after two months of start of continuation phase, and second when the continuation phase ends. Such patient continues to take the same treatment regimens (DOTS) till completion or becomes smear negative. In continuation phase the patients collect the drugs in strip / blister pack weekly and first dose is given in front of health worker only. For the chronic cases it is advisable to conduct sensitivity test.

Table 9.6: Doses of Antitubercular drugs for Adult and children

MEDICATION		ADULT			CHILDREN	
	Drug Action	Daily Dose Regimen	Dose Thrice a wk	No. of pills in combipack	Daily Dose	Thrice a week
ISONIAZID	Bactericidal	300mg	600 mg.	2	5 mg/Kg.	10-15 mg./Kg.
RIFAMPICIN	Bactericidal	450-600mg	450 mg.*	1	10 mg/Kg.	10 mg./Kg.
PYRAZINAMIDE	Bactericidal	1-1.5gm	1.5gm	2-3	25 mg/Kg.	35 mg./Kg.
STREPTOMYCIN**	Bactericidal	0.75-0.5gm	0.75 gm.	-	15mg/Kg.	15 mg./Kg.
ETHAMBUTOL#	Bacteriostatic	800mg	1200 mg.	2-3	15 mg/Kg.	30 mg./Kg.
THIACETAZONE	Bacteriostatic	150mg	Not Applied	-	2.5 mg/Kg	Not Applied
OFLOXACINE/CIPRO	Bactericidal	200/400mg				
KANAMYCINE	Bactericidal	1gm				
ETHIONAMIDE	Bactericidal	250-1gm				
CYCLOSERINE	Bacteriostatic	250mg				

* *Patient who weigh 60 Kg. or more are given an extra 150 mg. dose*

** *Patient over 50 years of age are given 0.5 gm. of streptomycin*

 # Ethambutol should not be given in children below 6 years of age

Table 9.7: Side effects of Antituberculosis Drugs

Drug	Side effects
Isoniazid	Hepatitis, peripheral neuropathy, pellagra like syndrome, skin rash, drowsiness, and fatigue
Rifampicin	Hepatitis, Flu like syndrome, skin rash, gastritis, respiratory and hemolytic syndromes, orange discoloration of urine, saliva, and sweat, etc.
Pyrazinamide	Hepatitis, joint pains and sometime gout due to hyperuricemia,
Ethambutol	Ocular toxicity, decrease in visual acuity, blurring and red-green color blindness. Not recommended in children less than 6 years of age, gastrointestinal toxicity, peripheral neuropathy
Streptomycin	Vestibular damage leading to nystagmus, unsteadiness of gait, reduces hearing, hypersensitivity reaction, impairment in excretory function of kidney, contraindicated in pregnancy. Use of unsterile needles and syringes for injection can be the risk of transmission of HIV or Hepatitis B and C.
Ofloxacin/Cipro	GI symptoms: nausea, vomiting, anorexia, anxiety, dizziness, headache, convulsion, rupture of the Achilles tendon
Kanamycin	Vestibular and auditory symptoms, cutaneous hypersensitivity
Ethionamide	GI Symptoms: diarrhea, abdomen pain, hepatotoxicity, convulsion, mental symptoms, impotency, gynecomastia

Smear negative patients: Two smears are examined for follow up at the end of two months of treatment (intensive phase) and at the end of treatment (Six months). If the patients become sputum positive during the treatment he is started on a treatment regimen afresh and registered as "others" in category II.

PEDIATRIC TUBERCULOSIS

Tuberculosis is a major cause of childhood morbidity and mortality. It is estimated that about 6-8% of all new TB cases are in the pediatric age group and majority is in 1-4 years. Childhood TB is a reflection of the prevalence of sputum positive pulmonary tuberculosis in the community and the extent of transmission of infection in the community. Children suffer from severe forms of TB because of their poor immunity.

Diagnosis of Paediatric TB (0-14 years):

A new diagnostic algorithm is developed for pulmonary TB, the commonest type of extra pulmonary TB (Lymph node TB) and for other types of extra-pulmonary TB. The diagnostic algorithms for the diagnosis of pulmonary TB and Lymph node tuberculosis is as follows.

Best is to demonstrate bacteriological evidence in the diagnosis of pediatric TB. In cases where sputum is not available for examination or sputum microscopy fails to demonstrate AFB, alternative specimens (Gastric lavage, Induced sputum, broncho-alveolar lavage) should be collected, depending upon the feasibility, under the supervision of a paediatrician. A positive Tuberculin skin test / Mantoux positive were defined as 10 mm or more induration. There is no role for inaccurate and inconsistent diagnostics like serology (IgM, IgG, IgA antibodies against MTB antigens), various inhouse or non-validated commercial PCR tests and BCG test. Loss of weight was defined as a loss of more than 5% of the highest weight recorded in the past three months.

Treatment

The intermittent therapy will remain the mainstay of treating paediatric patients. However, for children with severe disseminated disease, Neuro-tuberculosis and seriously ill hospitalised children having high likelihood of vomiting and intolerance to oral drugs, an initial daily supervised therapy during their stay in the hospital is needed. After discharge they will be taken on thrice weekly DOT regimen.

The following are the daily doses (mg per kg of body weight per day):

Rifampicin 10-12 mg/kg (max 600 mg/day), Isoniazid 10 mg/kg (max 300 mg/day), Ethambutol 20-25mg/kg (max 1500 mg/day), PZA 30-35mg/kg (max 2000 mg/day) and Streptomycin 15 mg/kg (max 1gm/day).

Newer Case definitions for paediatric TB patients:

a. Failure to respond: A case of paediatric TB who fails to have bacteriological conversion to negative status or fails to respond clinically / or deteriorates after 12 weeks of compliant intensive phase shall be deemed to have failed response provided alternative diagnoses/ reasons for nonresponse have been ruled out.

b. Relapse: A case of paediatric TB declared cured/ completed therapy in past and has (clinical or bacteriological) evidence of recurrence.
c. Treatment after default: A case of paediatric TB who has taken treatment for at least 4 weeks and comes after interruption of treatment for 2 months or more and has active disease (clinical or bacteriological).

Drug dosages in Children

There will be six weight bands and three generic patient wise boxes will be used in combination to treat patients in the six weight bands. The newer weight bands are 6-8 kg, 9-12 kg, 13-16 kg, 17-20 kg, 21-24 kg and 25-30 kg.

There are 4 types of pediatric boxes:

PC 13 (Yellow box)

PC 14 (Orange Box)

PC 15 (Purple Box) and PC 16 (Grey Box) - For prolongation of intensive phase

A patient weighing 6 –10 kg would require 1 box of Product Code 13

A patient weighing 11 –17 kg would require 1 box of Product Code 14

A patient weighing 18–25 kg would require 1 box of Product Code 13 and 1box of Product Code 14.

A patient weighing 26 –30 kg would require 2 boxes of Product Code 14

Drug formulations

Since, the number of tablets is too many to consume and younger patients have difficulty in swallowing tablets the DOT centers will be provided with pestle and mortars for crushing the drugs. It will be the responsibility of the DOT provider to supervise the process of drug consumption by the child and in case any child vomits within half an hour of period of observation, fresh dosages for all the drugs vomited will be provided to the caregiver.

TB Meningitis: During intensive phase of TB Meningitis, Injection Streptomycin is to be replaced by Tablet Ethambutol.

Extending intensive and continuation phase:

Children who show poor or no response at 8 weeks of intensive phase should be given benefit of extension of IP for one more month.

a. In patients with TB Meningitis, spinal TB, miliary, disseminated TB and osteo-articular TB, the continuation phase shall be extended by 3 months making the total duration of treatment to a total of 9 months.

b. A further extension may be done for 3 more months in continuation phase (making the total duration of treatment to 12 months) on a case to case basis in case of delayed response and as per the discretion of the treating pediatrician.

TB preventive therapy: The dose of INH for chemoprophylaxis is 10 mg/kg (instead of currently recommended dosage of 5 mg/kg) administered daily for 6 months.

Indications:

a. All asymptomatic contacts (under 6 years of age) of a smear positive case, after ruling out active disease and irrespective of their BCG or nutritional status.

b. Chemoprophylaxis is also recommended for all HIV infected children who either had a known exposure to an infectious TB case or are Tuberculin skin test (TST) positive (>=5mm induration) but have no active TB disease.

c. All TST positive children who are receiving immunosuppressive therapy (e.g. Children with Nephrotic syndrome, acute leukemia, etc.).

d. A child born to mother who was diagnosed to have TB in pregnancy should receive prophylaxis for 6 months, provided congenital TB has been ruled out. BCG vaccination can be given at birth even if INH chemoprophylaxis is planned.

Orange box	***Yellow Box***
24 strips	*24 strips*
H=150 mg	H=75 mg
R=150 mg	R=75 mg
Z=500 mg	Z=250 mg
E=400 mg	E=200 mg
18 strips	
H=150 mg	H=75 mg
R=150 mg	R=75

Pediatric TB does not accord high priority as it is less infectious. But because of serious forms of TB that occurs in children they are more likely to die if not treated properly.

MULTI-DRUG RESISTANT (MDR) TUBERCULOSIS

A patient is confirmed to have drug resistant TB only by an RNTCP quality assured Culture & DST Laboratory. Such patients are classified according to the following definition:

- **Drug-resistant case:** A patient whose TB is due to tubercle bacilli that are resistant *in vitro* to at least one *anti*-TB drug according to accepted laboratory methods in an RNTCP accredited laboratory.
- **Mono-resistance:** A patient whose TB is due to tubercle bacilli that are resistant *in vitro* to exactly one anti-TB drug in an RNTCP accredited laboratory.
- **Poly-resistance:** A patient whose TB is due to tubercle bacilli that are resistant *in-vitro* to more than one anti-TB drug, except not both isoniazid and rifampicin in an RNTCP accredited laboratory.
- **MDR-TB case:** An MDR-TB suspect who is sputum culture positive and whose TB is due to *Mycobacterium tuberculosis* that are resistant *in-vitro* to isoniazid and rifampicin with or without other anti-tubercular drugs based on DST results from an RNTCP accredited Culture & DST Laboratory.

Drug resistance develops either due to infection with a resistant strain, or as a result of inadequate treatment such as when a patient is exposed to a single drug, or because of elective drug intake, poor compliance, use of inappropriate non-standardized treatment regimens, irregular drug supply, poor drug quality, or rarely erratic absorption of medications. As per WHO's "Global Tuberculosis Report, 2012", India account for an estimated 64000 patients out of 310000 cases of Drug Resistant TB estimated to have occurred amongst the notified cases of TB across the globe in a year (Table 9.8).

MDR is another serious problem and quite often due to this, program fail to achieve cure rate more than 50% with most efficient second line drugs available. Nonadherence to treatment due to lack of affordability, high cost of treatment and drug toxicity is important for MDR TB. The prevalence of initial MDR ranges from 0-3%. Acquired drug resistance is ranging from 10-15%. But it is stated that there is 4.3% cases of MDR (Zignol et al 2006). Available data from the

Table 9.8 : MDR TB burden in India

TB burden	Number (millions) (95%CI)	Percent (95%CI)
HIV among estimated incident of TB patients	-	5.7 (4.8- 6.6)
MDR- TB among notified pulmonary TB patients	0.062 (0.05 - 0.074)	-
MDR-TB among notified new pulmonary TB patients	0.02 (0.018- 0.025)	2.2 (1.9- 2.6)
MDR- TB among notified re treatment pulmonary patients	0.042 (0.033- 0.054)	15(11- 19)

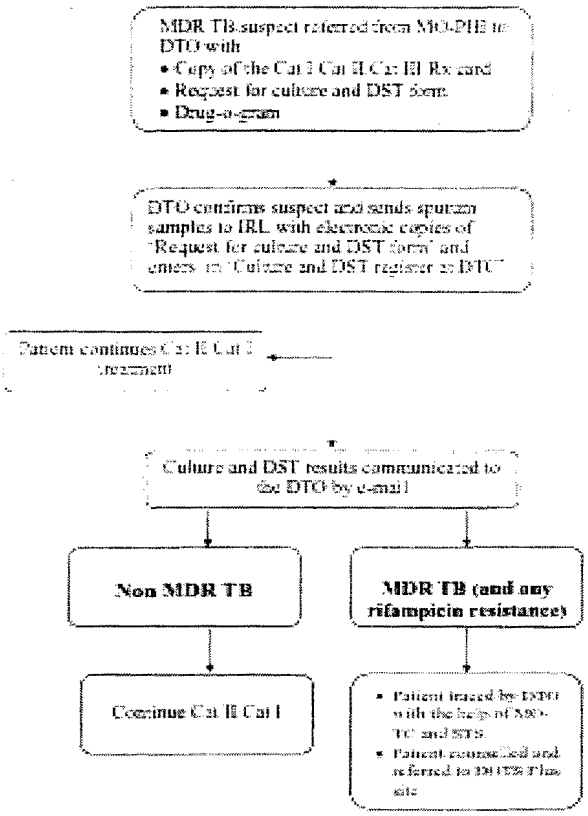
earlier district-wise and now state representative surveys in Gujarat and Maharashtra have found ~3% MDR-TB. However, in tertiary center the drug resistance could be much higher. MDR TB could be responsible for more chronicity, extensive drug resistance and deaths. To address the issue, it is planned that by 2015 drug susceptibility testing will be made available to all smear positive cases registered under the program. This is further complemented by a nationwide laboratory scale up with 43 culture & DST laboratories (Solid & LPA techniques including Liquid Culture in 33 labs) in the public health sectors by 2015. Flags of MDR patient is given in Fig. 9.8.

Diagnosis is based on clinical indication to offer DST to initially all failures of first line regimen, and contacts of known MDR TB case. Subsequently, services will be extended to all smear positive re-treatment cases at diagnosis, smear positive follow up case and finally to all smear negative retreatment cases at diagnosis and HIV associated TB cases at diagnosis.

Patient of MDR is managed according to following principles:

1. Detailed appraisal of the treatment history of the patient regarding the drugs used, period and dosage.
2. Review of skiagrams of chest taken in the past in case of pulmonary TB, or review of basic tests in case of extra-pulmonary TB.
3. Intensive motivation of the patient explaining the need for regular and longer treatment up to 2 years or more as advised.
4. Choose a regimen, which is affordable for patient awaiting the results of sensitivity studies.
5. Add at least 3 new drugs for the treatment of MDR; total drugs may be as many as 6 or 7 drugs. Prefer to include one injectable preparation.

Figure 9.8: Confirmation of diagnosis of MDR Patient



6. The patient needs to be reviewed after at least 6 weeks by smear microscopy and radiological assessment apart from symptomatic improvement.
7. If these assessment point to improvement, the same schedule is continued for next 6 week i.e. till the results of culture and sensitivity are available, otherwise the regimen may be altered suitably and reviewed after sensitivity results.
8. Because of the high risk of relapse the treatment in case of MDR TB is continued for at least 18-24 months after culture has converted to negative with regular follow up at approximately 6 weeks intervals.
9. Some cases may be assessed for resectional surgery provided the disease is localized and there are no other adverse factors for surgery.

Standardized treatment regimen for MDR TB under daily DOT includes (6-9m) Kanamycin, Levofloxacin, Cycloserine, Ethionamide, Pyrazinamide, Ethambutol / (18m) Levofloxacin, Cycloserine, Ethionamide, Ethambutol. PAS is used as a substitute drug in case of intolerance. In cases with Ofloxacin or Kanamycin resistance detected at baseline wherever facilities to undertake quality assured DST to second line drugs is locally available, the regimen for MDR TB can be suitably modified to replace Levofloxacin with Moxifloxacin and PAS or to replace Kanamycin with Capreomycin respectively.

Extensively Drug Resistant TB (XDR-TB)

Extensively Drug Resistant Tuberculosis: Extensive Drug Resistant TB (XDR TB) is defined as **"XDR-TB is a subset of MDRTB with additional resistance to Fluoroquinolones and one of the second line injectables namely Kanamycin, capreomycin and Amikacin."** XDR-TB has been reported in all regions of the world. In India too, XDR-TB has been reported by isolated studies with nonrepresentative and highly selected samples. It is found that 9.9% of the MDR TB cases are XDR TB (Sarita et al 2007). DOTS Plus which is handling MDR cases have serious threat from XDR TB. This need to be tackled through population based surveillance for second line drug susceptibility testing and improving compliance of patients in DOTS plus. For diagnosis of XDR-TB, DST for second line drugs is extended to patients on failure of MDR TB treatment when culture remains positive at 6 months. For drug susceptibility testing sputum specimen is transported to accredited reference laboratory. Rapid molecular test like Line Probe Assay (LPA) and CBNAAT, if available is the preferred DST method for first line drugs. DST for 2nd line drugs is done at 3 National Reference Labs (NIRT-Chennai, NTI-Bangalore, LRS Institute of TB & RD-Delhi). DST to second-line drugs will be offered to all confirmed MDR TB cases at diagnosis as the lab capacity becomes increasingly available in all 33 labs being developed for liquid culture and DST in a phased manner up to 2015.

DOTS-Plus

DOTS-Plus refers to DOTS programs that add components for MDR-TB diagnosis, management and treatment. The DOTS-Plus strategy promotes full integration of DOTS and DOTS-Plus activities under the RNTCP, so that patients with MDR-TB are both correctly identified and properly managed. DOTS-Plus is having five components:

1. Sustained government commitment;
2. Accurate, timely diagnosis through quality assured culture and drug susceptibility testing (DST);

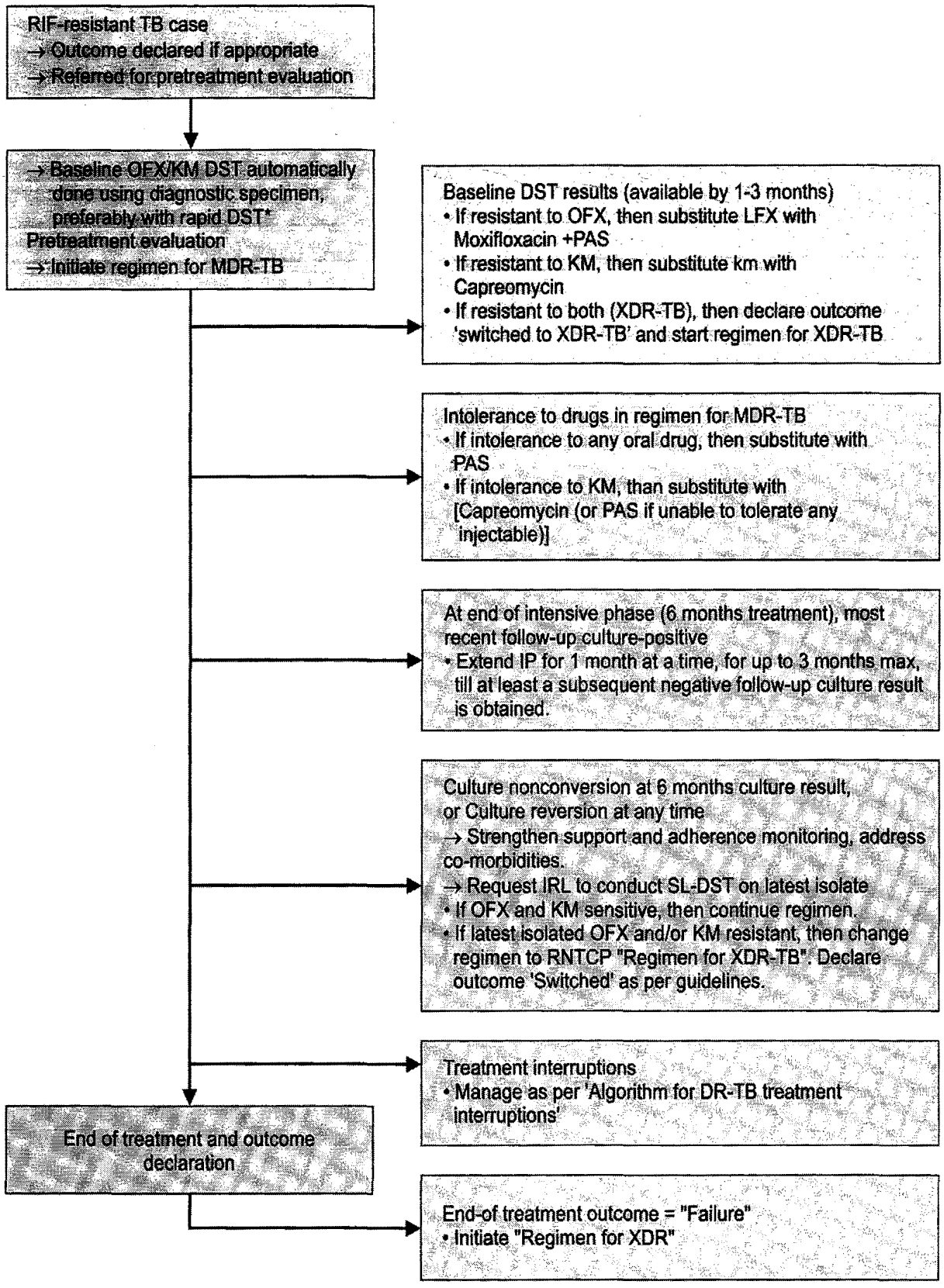

RIF-resistant TB case
→ Outcome declared if appropriate
→ Referred for pretreatment evaluation
→ Baseline OFX/KM DST automatically done using diagnostic specimen, preferably with rapid DST*
Pretreatment evaluation
→ Initiate regimen for MDR-TB
Baseline DST results (available by 1-3 months)
• If resistant to OFX, then substitute LFX with Moxifloxacin +PAS
• If resistant to KM, then substitute km with Capreomycin
• If resistant to both (XDR-TB), then declare outcome 'switched to XDR-TB' and start regimen for XDR-TB
Intolerance to drugs in regimen for MDR-TB
• If intolerance to any oral drug, then substitute with PAS
• If intolerance to KM, than substitute with [Capreomycin (or PAS if unable to tolerate any injectable)]
At end of intensive phase (6 months treatment), most recent follow-up culture-positive
• Extend IP for 1 month at a time, for up to 3 months max, till at least a subsequent negative follow-up culture result is obtained.
Culture nonconversion at 6 months culture result, or Culture reversion at any time
→ Strengthen support and adherence monitoring, address co-morbidities.
→ Request IRL to conduct SL-DST on latest isolate
• If OFX and KM sensitive, then continue regimen.
• If latest isolated OFX and/or KM resistant, then change regimen to RNTCP "Regimen for XDR-TB". Declare outcome 'Switched' as per guidelines.
Treatment interruptions
• Manage as per 'Algorithm for DR-TB treatment interruptions'
End of treatment and outcome declaration
End-of treatment outcome = "Failure"
• Initiate "Regimen for XDR"

Figure 9.9: Integrated Treatment Algorythm

3. Appropriate treatment utilizing second-line drugs under strict supervision;
4. Uninterrupted supply of quality assured anti-TB drugs; and
5. Standardized recording and reporting system.

Category II previously treated patients, who remain sputum positive even after 4 months of supervised treatment will be identified as MDR-TB suspects and referred for diagnosis by culture and DST done at an RNTCP accredited IRL. On being diagnosed as an MDR-TB case, the patient will be referred to a designated state level DOTS-Plus Site Figure 9.8. The DOTS-Plus site will be supported by qualified staff available to manage patients using the standardized second-line MDR drugs regimen given under daily DOTS and Standardized follow-up protocols. There will be mechanisms to deliver ambulatory DOTS after an initial short period of up to one month of inpatient care to stabilize the patient on the second line drug regimen, and a logistic and standardized information system will be in place.

The flow of MRD patients in DOTS Plus is given in Figure 9.9. Standardized treatment Regimen for XDR TB under daily DOT includes (6-12m) Capreomycin, PAS, Moxifloxacin, high dose INH, Clofazimine, Linezolid, Amoxy-Clavulanic Acid / (18m) all the above drugs except Capreomycin. Clarithromycin and Thiacitazone used as a substitute drug in case of intolerance.

Hence for general patient the flow of patient is given in figure 9.10.

Figure 9.10: General Model of the Health Care delivery for the TB patients

Chest Symptomatic
|
Microscopy Center (1 Lakh Population)
(DTC/CHC/PHC)
|
Diagnosis and treatment
(PHC/CHC/DTC)
|
DOTS
Subcenter - Multipurpose Worker
Village level - Anganwadi Worker/ Dai,
Village Health Guide (VHG), ASHA

Newer initiative in diagnosis of TB

RNTCP is conducting Systematic feasibility study introducing Genexpert in 18 Tuberculosis Units across the 12 states under programmatic conditions. The program also implementing the EXPAND-TB project to supplement laboratory capacity by rapid DST for MDR-TB suspects in10 sites across the nine states covering 70 districts, which are currently facing laboratory capacity deficit to accelerate the PMDT scale up plan of the country. The RNTCP in collaboration with union and NRLs is implementing project LED Fluorescent Microscopy in high workload Teaching Hospitals with the aim to improve cost effectiveness and time efficiency.

Implementation of Revised Strategy

Organizational structure is presented in Table 9.8 & Fig. 9.10. This Directly Observed Therapy in which a trained peripheral health worker such as a multipurpose worker or DOTS provider watches as patients swallow all medications, is fundamental to assuring cure. DOTS should be ensured for every dose of Rifampicin containing regimens at least in intensive phase of treatment.

Table 9.9: Organizational Structure of National TB Control Program

Level	Organization
National Level	1. Deputy Director General (TB)
	2. National TB Institutions
State level	1. State TB Training & Demonstration Center
District level	
Urban	1. Metropolitan city (TB officer)
Rural	1. District Health Officer & District TB Officer
	2. District TB Center
Subdistrict level	
Urban	1. Ward (Chest Clinic)
Rural	1. Medical Officer (TB Control)
	2. TB Units (for 5 lac population: One of the CHCs)
Primary Health care level	
Urban	1. TB Centers
Rural	1. Community Health Center/ PHC

Who else can be the treatment observers?

Any responsible persons can be treatment observers for example, Village *surpunch*, malaria link workers, Landlord, Cured patients, Wife of District Tuberculosis

Organisational structure of RNTCP

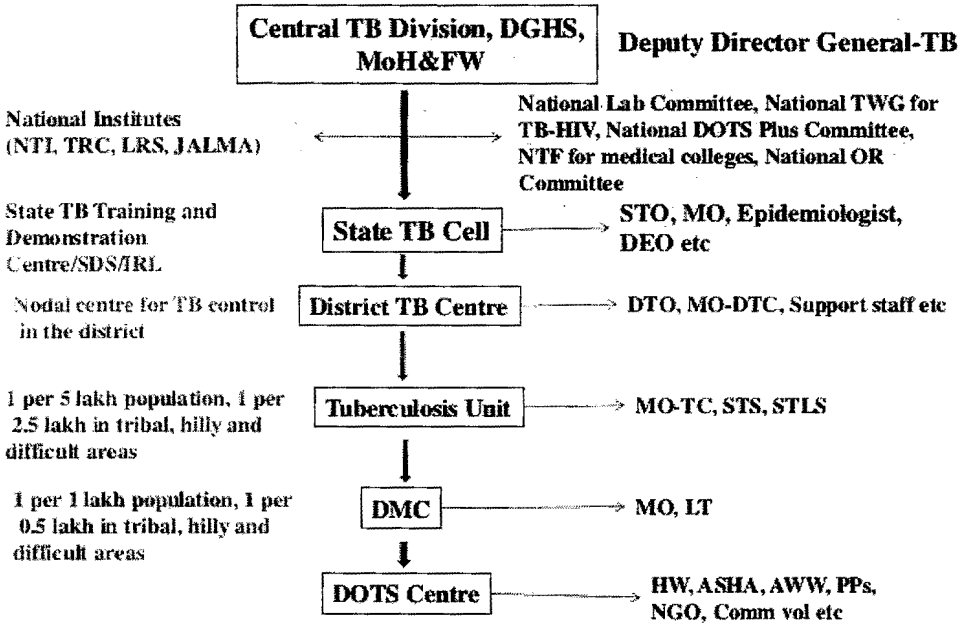

Central TB Division, DGHS, MoH&FW
Deputy Director General-TB
National Institutes (NTI, TRC, LRS, JALMA)
National Lab Committee, National TWG for TB-HIV, National DOTS Plus Committee, NTF for medical colleges, National OR Committee
State TB Training and Demonstration Centre/SDS/IRL
State TB Cell
STO, MO, Epidemiologist, DEO etc
Nodal centre for TB control in the district
District TB Centre
DTO, MO-DTC, Support staff etc
1 per 5 lakh population, 1 per 2.5 lakh in tribal, hilly and difficult areas
Tuberculosis Unit
MO-TC, STS, STLS
1 per 1 lakh population, 1 per 0.5 lakh in tribal, hilly and difficult areas
DMC
MO, LT
DOTS Centre
HW, ASHA, AWW, PPs, NGO, Comm vol etc

Fig 9.10: Organizational Structure

Officers, School teachers, *Zila Parishad Savadipati*, DTO, Policeman, Postman, Ayurvedic/Unani/ Homeopathic doctors, Pharmacists, Hotel managers, Self-help group volunteer NSS leader, Workplace supervisor, and housewife.

Monitoring and Evaluation System

RNTCP has inherent ability to conduct regular supervision and monitoring at all levels – national, state, district and sub district. In addition, a robust recording and reporting system and a series of routine review meetings enable early corrections.

Dedicated supervisory staff, a recording and reporting system and a set of monitoring indicators to cover all the related activities ensures that the program has an inherent capacity to identify issues and proactively consider remedial measures. There are supervisory visits and feedback, regular review meetings, periodic in-depth evaluations

In each district, District Tuberculosis Officer (DTO) is the overall In charge of the tuberculosis control activities and answerable to State Tuberculosis Officer at State Health Directorate. Tuberculosis register is kept at subdistrict (Tuberculosis Unit: one for 5 lakh population) level in the district or ward level in metropolitan cities. Tuberculosis treatment card of the patient is kept in all peripheral health units. A duplicate card is given to the peripheral health functionaries who administer DOT. Patients keep identity cards only.

One TU is manned by one medical officer, Senior Tuberculosis Supervisor (STS), and Senior Tuberculosis Laboratory Supervisor (STLS) which is meant for 5 lakh population. Quarterly report on case-finding, smear conversion rate of patients who are on treatment and all possible outcomes of smear-positive cases of pulmonary TB (Cured, Treatment completed, failure, Defaulted, Died, and Transferred out) is prepared by the Senior Tuberculosis Supervisor (STS). The Senior Tuberculosis Laboratory Supervisor (STLS) is primarily responsible for supervising all the laboratory activities including checking 100% of sputum positive slides and at least 10% of sputum negative slides. It is the responsibility of the Tuberculosis Unit (TU) to compile and submit the report to the District Tuberculosis Officer (DTO), who compiles the report (4 copies) in respect to all TB Units and sends three of them to the State Tuberculosis Officers (STO), the National Tuberculosis Institute (NTI) Bangalore, and to the Central TB Division, DGHS, Nirman Bhawan, New Delhi (Figure 9.7). Detailed feedback is given to the district and state authorities. Funds are released to State Health Society

which further goes to district health societies. Under the RNTCP, all district TB officers are supplied with a computer with internet facilities, a data entry operator and individual email address. Every quarter, the states provide routine feedback to each of their districts on the quarterly performance of the respective district. The quarterly performance report is a published document, both in printed and electronic form on the RNTCP website, which ensures wide dissemination of the report. Window-based Epi-center software has been developed and field tested in West Bengal and Rajasthan.

Human Resource Development

There are three types of training for the personnel providing RNTCP services:

1. Initial RNTCP training: this includes all induction trainings in RNTCP of newly placed staff or replacement staff following staff turnover.
2. Retraining: This is organized mainly for individuals who, have already received initial RNTCP training, but who during supervision, have been identified to require retraining.
3. Updates on new activities and initiatives: These updates are planned mainly during routine activities such as the regular program review meetings.

The medical practitioners of the NGOs, PPs and other sectors like railways, mines, ports, etc., are trained.

HIV Infection and Risk of Tuberculosis

HIV increases the susceptibility to infection with M. tuberculosis. In a person infected with Mycobacterium tuberculosis, HIV is a potent cause of progression of tuberculosis infection to disease. A HIV positive person is six times more likely to develop TB disease once infected with TB bacilli, as compared to an HIV negative person, who has a 10% lifetime risk. As HIV infection progresses, CD4 lymphocytes decline in number and function and the immune system is less able to prevent the growth and local spread of M. tuberculosis. The duration of TB in HIV infected persons is more difficult on account of more non-TB respiratory diseases, more smear negative, disseminated and extrapulmonary TB and X-rays being less specific. Fortunately more than 90% of surviving HIV infected TB can be cured provided complete treatment is taken regularly. But there is more chance of relapse and reinfection of TB in HIV patients. The serious concern is large number of HIV infection in India, which is almost as high as 2.5 million and in some states it is already 1% of the population. High prevalence of TB cases in India and increasing number of HIV positive cases could be dangerous combination and a serious threat to the control program because more TB means more transmission. WHO has estimated a prevalence of 1.2% of HIV in adult TB patients in India.

NATIONAL FRAMEWORK FOR JOINT TB/ HIV COLLABORATIVE ACTIVITIES

As per NACO sentinel surveillance report of 2006, the prevalence of HIV infection is estimated to be 0.36 % of the population, which translates to 2.5 million people living with HIV/AIDS in India. Tuberculosis (TB) continues to be a public health challenge in India and it is estimated that 2.3 million cases of TB occur in India annually. Active TB disease is the commonest opportunistic infection amongst HIV-infected individuals. A low cost and high quality cure for TB is provided under the Revised National TB Control Program (RNTCP), which is implementing the DOTS strategy of diagnosis and treatment for TB nationwide. Standard short-course anti-TB regimens have been shown to be effective in TB patients with or without HIV infection.

TB-HIV collaborative activities started initially in the year 2001, in the six states with high prevalence of HIV/AIDS i.e. Andhra Pradesh, Karnataka, Maharashtra, Manipur, Nagaland and Tamil Nadu. The collaborative activities were extended to eight additional States of Delhi, Gujarat, Himachal Pradesh, Kerala, Orissa, Punjab, Rajasthan and West Bengal in the year 2004. In 2007-08, TB-HIV collaborative activities were extended to the entire country and have been included as an integral part of NACP IV and RNTCP.

Goal

The goal of the National framework is to further enhance collaboration between RNTCP and NACP, and reduce the burden of TB and HIV in India.

Objectives

1. To establish mechanisms for coordination between RNTCP and NACP at National, State and District levels.

2. To decrease morbidity and mortality due to tuberculosis among persons living with HIV/AIDS.
3. To decrease the impact of HIV in tuberculosis patients and provide access to HIV related care and support to HIV-infected TB patients.

Key Activities identified under TB/HIV coordination include:

1. Establishment of coordination mechanisms at national, state and district level.
2. Service delivery coordination and cross-referrals, through training of the program officials and the field staff and establishment of linkages between service delivery sites of NACP i.e. ART centres, ICTCs, care and support centres and RNTCP diagnostic and treatment services.
3. Involvement of NGOs working in NACP and RNTCP in TB/HIV collaborative activities.
4. Operational research to improve the implementation of TB/HIV collaborative activities.
5. Implementation of feasible and effective infection control measures

1. Establishment of coordination mechanisms at national, state and district level

The following Coordination committees and technical working groups are proposed to be established:

I. National Technical Working Group (TWG) at the national level is to review, optimize and plan for future TB/HIV Coordination activities. The function of National TWG also includes supervision of TB/HIV collaborative activities by officials of both programs.

II. State Level: A. State Coordination Committees to ensure smooth implementation and regular review of TB/HIV Collaborative activities. B. State Technical Working Group (STWG) would review and streamline the collaborative activities. In these monthly meetings of TWG, apart from a review of the on-going TB/HIV collaborative activities, the key issues emerging from the district coordination meetings and the cross-referral reports are to be discussed.

III. District level: A. District Coordination Committees to ensure smooth implementation and regular review of TB/HIV Collaborative activities.

IV. Annual Review of TB/HIV Collaborative activities at National and State level: RNTCP conducts regular program reviews in which an annual review of the TB/HIV. Collaborative activities would be held.

V. Human Resources for TB/HIV collaborative activities to facilitate coordination and successful implementation of TB/HIV collaborative activities.

Extra Human Resource

A. Full-time regular government officer would be in charge of TB/HIV Collaborative activities in the programs at the National and State level in NACP and RNTCP. Additional technical support has been provided by RNTCP in form of 2 WHO RNTCP Consultants for TB/HIV collaborative activities at the National level (One at NACO and one at CTD)

B. High HIV-Prevalence States: Medical Consultants for TB/HIV have been sanctioned by NACP (for SACS) in Andhra Pradesh, Karnataka, Maharashtra, Tamil Nadu, Nagaland, and Manipur.

C. Additional States: TB/HIV Coordinators have been sanctioned by RNTCP in Assam, Bihar, Chhattisgarh, Delhi, Gujarat, Himachal Pradesh, Jharkhand, Kerala, Madhya Pradesh, Orissa, Punjab, Rajasthan, Uttar Pradesh, Uttaranchal and West Bengal.

2. Service Delivery Coordination and Cross referral

All settings

- Training of program officials and field staff on TB/HIV
- Intensified TB Case Finding at ICTCs, ART Centres, and Care and Support Centres
- Risk-based referral of TB patients for voluntary HIV counselling and testing
- Referral of HIV-infected TB patients to NACP for additional care and support, including antiretroviral treatment

Intensified TB/HIV package of services

- Routine referral of all TB patients for HIV counselling and testing
- Provision of cotrimoxazole preventative therapy (CPT) to HIV-infected TB patients
- Expanded recording and reporting

NACO recommends (March, 2007) that ART be given to:

- All patients with extrapulmonary TB (stage 4) and
- All those with pulmonary TB (stage 3) with CD4 count is < 350 cells/mm3.

3. Advocacy, Communication and Social Mobilization and involvement of NGOs working in NACP and RNTCP in TB/HIV collaborative Activities

There are a large number of NGOs working with both NACP and RNTCP. These NGOs play an important role in program implementation by increasing the out reach of the individual programs and the provision of a package of services to difficult to reach populations like migrant populations, truck drivers, tribal populations, commercial sex workers, etc.

IEC activities

RNTCP and NACP IEC material should be displayed at the ICTCs, ART centres, DMCs and other facilities providing care and support to PLWHA and TB patients. Activities can be conducted by NGOs are:

4. Operation Research to improve the implementation of TB/HIV collaborative activities

Operational research in TB/HIV would be directed towards achieving the wider objectives of decreasing the morbidity and mortality due to tuberculosis in people living with HIV/AIDS and decreasing the burden of HIV in tuberculosis patients and provide access to HIV related care and support to HIV-infected TB patients.

The priority areas for collaborative operational research with both programs for TB/HIV include:

1. Piloting mechanisms of provider-initiated routine referral of TB patients for counselling and testing for HIV.
2. Improving access to HIV related care and support for TB patients who are found to be HIV-infected.
3. Estimating TB burden in various setting providing HIV care, like ICTCs, ART centres, and care and support centres.
4. Strengthening referral linkages from ICTCs, Care and Support Centres, and ART centres to RNTCP services.
5. Strengthening referral linkages of HIV-infected TB patients from general health services to ART centres.
6. Reducing mortality of HIV-infected TB patients during and after TB treatment.
7. Evaluating the feasibility, efficacy, and optimal duration of Isoniazid prophylactic therapy for prophylaxis of TB at ART and care and support centres.
8. Development of TB screening guidelines for ART centres and care and support centres.

5. Infection Control Practices

Prevent spread of TB in facilities caring for HIV infected persons

In health care settings frequented by high numbers of HIV-infected persons, measures to reduce airborne tuberculosis transmission should be undertaken. These include simple administrative and environmental measures aimed at generally reducing exposure of HIV-infected patients to *M. tuberculosis*.

Administrative measures should first include early recognition, diagnosis and treatment of tuberculosis cases under RNTCP, particularly those with smear positive pulmonary tuberculosis. These steps should also include separation of pulmonary tuberculosis suspects from HIV-infected patients e.g. in patients waiting areas, until a TB diagnosis is excluded or confirmed and effective TB treatment initiated. Environmental protection should include maximizing natural ventilation. General guidelines for infection control will be prepared, and will be particularly applicable in facilities with large numbers of HIV-infected persons.

Prevent spread of HIV through Safe injection practices in Facilities providing RNTCP services

Measures to reduce parenteral HIV transmission include the use of sterilized injection and surgical equipment in medical settings. Steps should be undertaken by concerned authorities (SACS, State and District administration) to ensure the availability at all times and all facilities, of sterilized disposable needles and syringes and needle destroyers.

INTENSIFIED TB CASE FINDING AT ART CENTERS

Provisional Guidance from NACP and RNTCP

HIV-infected persons attending ART centers for pre-ART registration have a high prevalence of TB disease. The incidence of TB disease among ART clients is

also very high. While ART reduces the risk of TB disease, this risk is still remains many times higher than the general population. Hence intensified TB case finding at ART centers is very important for early suspicion and diagnosis of TB. The ART guidelines describe that all patients coming to centre should be screened for opportunistic infections specially TB before start of ART.

The ART centers Medical officer should have a very high index of suspicion for TB and ensure that TB disease in clients attending ART centre is not missed. This provisional guidance is intended to define the minimum standard for TB disease screening among clients attending ART centers. This guidance is expected to evolve, as ongoing and planned operational research will clarify the optimum screening and diagnostic procedures for TB.

Counselors & Other Para-medical staff of ART Center: Screen all patients (even if no complaint), for the following signs and symptoms of TB.

If symptoms are suspicious for TB disease are present:

- ART Centre health staff to refer patient to ART MO for clinical evaluation
- ART Centre medical officer to refer patient on the same day for:
  1. Sputum microscopy to the institutional Designated Microscopy Centre
  2. Chest X-Ray, if indicated as per NACO ART guidelines
  3. For additional investigations as clinically indicated in ART guidelines like FNAC, Ultrasound, etc.

All patients encounter at the ART centre following:

- Pre-ART registration & follow-up visits
- ART initiation
- Monthly visits to ART centre & ART medical follow up (6 monthly)
- Unscheduled follow-up visits

TB diagnosis and treatment

- TB Diagnosis to be done based on RNTCP diagnostic algorithm
- In case the client has three negative sputum smear examination results, but has abnormal Chest X-rays, diagnosis of TB disease should be decided in clinical consultation between ART MO & RNTCP MO.
- All patients diagnosed with TB disease should be initiated on RNTCP DOTS as quickly as possible and be referred for treatment to a DOTS centre near their place of residence.
- Once client is initiated on TB treatment, feedback to be provided to ART Centre.
- For clients not initiated on ART so far, once the TB treatment is started, ART should be considered as per NACP guidelines.

Recording

- Referral to RNTCP: Use standard RNTCP sputum referral slips, indicating patient is from ART centre
- At RNTCP DMC: In the RNTCP Lab register, ART Centre is to be recorded as the referring centre
- Initiation on DOTS: As per RNTCP referral for treatment mechanism, by DMC staff
- At ART Centre: TB diagnosis & initiation on DOTS to be recorded on ART treatment cards & registers, per NACO guidelines

Supervision

Nodal officers should take on the responsibility of ensuring that this activity is occurring, and that patients are being appropriately referred if symptom-positive. During supervision visits, both programs should interact with patients at ART centre to see if they have been asked about the presence of the above symptoms/ signs.

Progress

1. Intensified TB case finding has been implemented nationwide at all HIV testing centres (known as integrated counselling and testing centres, or ICTCs) and has now been extended to all ART centres.
2. HIV testing of TB patients is now routine through provider initiated testing and counselling (PITC), implemented in all states with the intensified TBHIV package. During the year 2012, about 8, 21,807 (56%) TB patients were examined and 44,063 (5%) were found to be HIV positive. Among HIV-infected TB patients diagnosed in 2012, nearly 32,313 (92%) were started on co-trimoxazole

prophylaxis and nearly 26,051 (74%) were started on ART.

3. Policy decision has been taken by National Technical Working Group on TB/HIV collaborative activities (NTWG on TB/HIV) to expand coverage of whole blood finger prick HIV screening test at all DMC without a stand-alone or F-ICTC
4. The National AIDS Control Programme (NACP) and RNTCP have taken the policy decision to adopt Isoniazid prophylaxis therapy (IPT) as a strategy for prevention of TB among PLHIV whose implementation will be in a phased manner.

REVISED SCHEMES FOR NGOS AND PRIVATE PROVIDERS

RNTCP recognizes the need for involvement of all sectors –public and private to create an epidemiological impact of Tuberculosis control. The private health sector in the country is an important source of care even with the availability of public health services. The NGOs and private providers are considered closer to and more trusted by patients and perform an active role in health promotion in the community. Public private mix (PPM) has been recognized as an important component in the RNTCP with the aim to provide standardized treatment to all TB patients in the country.

The Government of India developed guidelines for NGO and private sector involvement in TB control. There are 2500 NGOs, 25000 PPs, 260 Medical colleges and 150 corporate houses, which are providing DOT services. Over a period of 7-8 years it has been observed that the uptake of schemes under a formal agreement has declined. There was a felt need for revision of the current schemes in view of the newer initiatives like DOTS plus, TB- HIV collaboration to improve the access of DOTS for the TB patients. The emergence of Multi-drug resistant TB has posed a challenge to the RNTCP implementation. The long duration of treatment would require social support network to facilitate adherence to ambulatory treatment. The DOT services in urban slums require involvement of private and NGO sectors to reach to special groups like migrants and slum dwellers.

Following areas are identified for collaboration with NGOs:

i. TB advocacy, communication, and social mobilization scheme
ii. Sputum collection centre/s Scheme
iii. Sputum pickup and transportation Scheme
iv. Designated Microscopy Centre Scheme
v. Laboratory Technician Scheme
vi. Culture-DST Scheme
vii. Treatment Adherence Scheme
viii. Urban Slum Scheme
ix. Scheme for Tuberculosis Unit
x. TB-HIV Scheme

RNTCP has had interacted with the major organizations of the corporate house like Confederation of Indian Industries, World Economic Forum, Federation of Indian Chamber of Commerce and Industry (FICCI) and the trade unions. Big companies such as Steel/Aluminium Plants, Cement Factories, National Thermal Power Corporation, Petrochemical Industries, Bharat Heavy Electrical Limited have microscopy centers. Jute mills, mines and sugar mills have DOT centers.

ADVOCACY, COMMUNICATION AND SOCIAL MOBILIZATION

Information Education and Communication (IEC) used in RNTCP to indicate communication initiatives that include Advocacy, Communication, and Social Mobilization (ACSM). Motivation plays an important role in prevention and treatment of Tuberculosis.

IEC strategy

- Detailed Planning, choice of communication channels and monitoring is decentralized to censure contextual relevance and wide reach of information.
- The state and districts to develop state and district-specific communication plans, and use local adoption and innovation to reach all target groups.
- IEC activities should be incorporated in annual report.
- Center has established multidisciplinary communication team-Advocacy and IEC unit.
- Additional support has been provided at the district level in the form of 'Communication Facilitators' that could be an agency, an NGO or an individual per 5-6 districts.
- Special communication initiatives for special groups and 'hard to reach population', such as tribal, marginalized population in urban slums, and

vulnerable section of society.
- Emphasized the involvement of community based organizations, NGOs, traditional healers, private practitioners, AWWs, CHWs, cured patients, tribal youth and other community based volunteers.

At individual level

Motivation helps patients to understand the disease and to use safer health practices so as to get cured and also prevent the further spread of infection. Secondly TB is a social stigma, it is very essential to explain to the patients and his family that all cases of TB are not infectious and risk of spread of infection depends on the level of infectiousness of the patient and the duration and intensity of contact.

At Community Level

Health education is an essential tool of community health. Health education is concerned with promoting health as well as reducing behavior – induced disease. "Health education is a process that informs, motivates and help people to adopt and maintain healthy practices and life styles, advocates environmental changes as needed to facilitate this goal and conducts professional training and research to the same end".

Health education issues need to be discussed at the time of registration, home visits and whenever patient comes to the DOTS center.

Guidelines for giving health education on TB

1. A Health Worker should always keep in mind the "principles of learning" used in health education.
2. Health education should be planned in such a way that it is the real health need of the people.
3. Health worker should keep in mind that it is people's program and they should be actively involved in the health education.
4. Start health education from where the people are and with what they understand and then add up to new facts, which are not known to them.
5. Language should be clear, simple with use of local words rather than using strange language. Make the program more interesting.
6. Following aspects is important in health education:
   a) Infectiousness of diseases.
   b) How tuberculosis is spread?
   c) Treatment during intensive and continuation phase and frequency of sputum examinations.
   d) Compliance of treatment and failing which can lead to resistance or failure of treatment.
   e) Treatment is free of cost at government centers and drugs are effective.
   f) Possible side effects of ATT and assurance to patient should be given.
   g) Diet and personal hygiene.

Important ACSM activities

School Awareness Program

As per Guidelines all schools & colleges are visited by RNTCP teams under ACSM activity in order to generate awareness and sensitize them towards TB as a disease, its cause, spread, availability of free diagnosis for early detection and availability of free treatment with quality assured drug (DOTS). Social myths, stigma and other misconception about TB need to be emphasized removed from the community.

COLLABORATION OF RNTCP ACTIVITIES WITHIN NRHM & NUHM

RNTCP is actively participating to improve management, service delivery and sharing innovation to strengthen health systems. It is helping in efforts to improve systems and policy, human resources and finances. The National Rural Health Mission is a mechanism which has provided an "umbrella" in all states with the repositioning of RCH and National Disease Control Programs in integrated State/District Health Societies. The gaps in infrastructure and service delivery in National programs are being addressed through "Additionalities under NRHM". The convergence of the TB control program with NRHM has taken place in all the states and Union territories of the country with the merger of State TB Control Society (STCS) into the ***"State Health Society" (SHS)*** and there is no change in implementation of RNTCP.

RNTCP is implemented through the general health system. The overall responsibility of implementing RNTCP activities rests with the staff under general health services. This State TB cell functions in close collaboration with the ***State Program Management & Support Units (SPMSU)*** wherever the PMSU have been created. The SPMSU will have experts in areas of human resource, M&E, Behavior Change Communication (BCC), and other technical areas. *This*

pool of skilled professionals like MBA, CA, MIS specialist and other RCH consultants will provide specific program support including TB control program. Under the mission, in order to reflect the requirements of the state in a consolidated ***"Program Implementation Plan" (PIP),*** the states have incorporated the various TB control activities.

The forthcoming National Urban Health Mission (NUHM) envisages to provide accessible and equitable health care services to the underprivileged urban slum dwellers and urban poor. The proposed upgradation of the urban health infrastructure and provision of additional manpower (such as Urban Social Health Activist (USHA) at the Urban Health Centres (UHCs) will be utilized by RNTCP and is expected to improve the TB referral, diagnostic and treatment services in the urban areas.

TB Surveillance

Central TB Division (CTD) in collaboration with National Informatics Centre (NIC) has develop a Case Based Web Based application named ***Nikshay.***

Objectives of Nikshay:

a) Short term:

1. To improve Tuberculosis surveillance in the country.
2. To facilitate individual patient wise monitoring & tracking of TB treatment.
3. To automate reporting, once the case wise data is regularly entered and update.
4. To facilitate online referral/transfer mechanism with real time information transmission to prevent patient loss.
5. To monitoring of TB Treatment saving the lead time in hard copy updating in TB register.
6. To make available of real time data at block & district for prioritized, focused supervision.
7. To create electronic Database of all TB patient details, for further in-depth analysis.
8. Effective Programme management (e.g. e-HRD, e-procurement e-supply chain, e-cash transfer).

b) Long term:

1. Linking the TB Database with UID (2016-17) for extending social welfare schemes
2. Disease trend & pattern studies for geographical understanding for epi-foci, using GIS for
   a. Contact tracing
   b. Identification of local / focal epidemics of MDRTB,
   c. Outbreaks investigation of XDR-TB

The Users of Nikshay are National (CTD), State (State TB Cell, State TB Demonstration Centre), District (District TB Cell), Tuberculosis Unit, Culture and Drug Sensitivity Laboratory, DR-TB Centre, State Drug Store. Details entered in this software are TB patient registration, diagnosis, treatment details, DOT provider details, follow-up smear examination details, treatment adherence details, HIV details, chemoprophylaxis details, health Establishment registration, TB patient notification entry, contractual staff details.

PREVENTION

Chemoprophylaxis

The family members or contacts of the sputum positive must be taught the importance of reporting to the health facility at the earliest if they have persistent cough of 2 weeks or more. People with these symptoms should undergo sputum examination as TB can be best diagnosed by sputum examination.

Children below 5 years of age who have been in contact with smear positive case must be screened for symptoms of TB. If a child is found symptomatic, a full course of antitubercular treatment must be given. If he is not symptomatic chemoprophylaxis (preventive chemotherapy) is given to the child, i.e., isoniazid (INH) 5 mg per Kg. body weight daily for 6 months irrespective of the BCG status. In these cases of INH chemotherapy, tuberculin test may be done after 3 months and if tuberculin test is negative (less than 6 mm induration) then preventive chemotherapy can be stopped and BCG can be given. If induration is more than 6 mm, chemotherapy is continued for another 3 months.

Breast-feeding must be continued irrespective of the sputum status of the mother because death due to diarrhea and malnutrition is much higher as compare to tuberculosis in very young children especially in developing countries. Pregnant woman with TB must start and continue their treatment during pregnancy; only injection streptomycin should be avoided as it can cause the 8th cranial nerve damage of the fetus.

BCG (Bacille Calmette-Guerin)

In the prevention of tuberculosis, general measures such as adequate nutrition, good housing and health education are important. The early detection and treatment of cases, chemoprophylaxis and immunoprophylaxis (intradermal injection of BCG) are equally important.

BCG is a live attenuated vaccine. According to WHO policy for BCG vaccination, in high TB prevalent country, BCG vaccine should be given to all children at the earliest except children with symptoms of HIV/ AIDS. In low TB prevalent countries there is no need of BCG immunization to HIV-infected children (WHO 1997). The meta-analysis of data from 16 prospective trials and 34 case-control studies of BCG efficacy indicate that vaccination with BCG significantly reduces the risk of tuberculosis, by an average of 76% and 65% (varies 51%-85%). Explanations for this variability include differences in the prevalence of infection with environmental bacteria and difference in BCG strains (Colelitz 1994, Wilson 1995, Behr 1999, Fine 2000, Zodpey 2006). Vaccination with BCG has been significantly associated with a reduction in both pulmonary and extra-pulmonary disease. The combined relative risk (RR) for death among those vaccinated with BCG was 0.29 and showed BCG vaccine has a 71% protective effect against death due to TB (Brewer 2000). With the average efficacy of 50% BCG cost per DALY gained is below US $ 50 (Borgdoff 2002).

Phenomenon after Vaccination

Two to three weeks after a correct intradermal injection of a potent vaccine, a papule develops at the site of vaccination. It increases slowly in size and reaches a diameter of about 4 to 8mm in about 5 weeks. It then subsides or breaks into a shallow ulcer, covered with a crust. Healing occurs spontaneously within 6 to 12 weeks leaving a permanent tiny & round scar.

Types of BCG Vaccination

BCG vaccine is produced in two forms: 1) wet or liquid vaccine; and 2) freeze dried which can be reconstituted before use. Freeze dried form of vaccine is in use, which has to be reconstituted by dissolving it in normal saline. BCG is a live vaccine and exposure to sunlight destroys the potency of the vaccine. The length of ampoule is kept long so as to avoid spillage of the powder while opening the ampoule.

Method of BCG vaccination

1. Oral: originally BCG was given through mouth but protection through this method was uncertain so the method has been given up.
2. Multiple puncture: in this method, a small quantity of BCG is put on skin and a special instrument is pressed on skin, which has number of sharp needles that pierce the skin. This is an obsolete method.
3. Intradermal: this is a standard method of BCG vaccination practically used all over the world. It is given in left arm just above the insertion of deltoid muscle. A satisfactory injection should produce a wheal of 5mm in diameter.

Dose of BCG

The usual dose is 0.05ml in infants up to one month and 0.1ml in children up to 1 year. If the scar does not appear even after 6 months, second BCG dose is not given. Each BCG vial/ ampoule contains 10 doses in dried form. It is dissolved in 1 ml of normal saline. Reconstituted BCG should be used within 4 hours. It is advisable to read the literature /instruction given on BCG ampoule before the start of vaccination.

Storage of BCG

BCG ampoule/vial and normal saline can be stored at 2 to 4 deg. C and should be used within six months of manufacturing.

Candidates for BCG vaccination

BCG can be given directly to children up to the age of one year. Under UIP it should be given at birth. For children between 1 to 5 years of age, tuberculin test is done; if test is negative BCG can be given whereas BCG can be avoided if tuberculin test positive.

Precautions to be taken before giving BCG

1. Sterile technique must be maintained throughout the procedure.
2. BCG must be stored in dark at 2-4 deg. C temperature.
3. Normal saline is used to dilute the vaccine.
4. The reconstituted vaccine must be used within 4 hours.
5. No special preparation of the skin is necessary. Spirit or dettol must be avoided, as they may destroy the live vaccine.
6. Needle used for injecting BCG can be destroyed by needle melter or incinerator.

Complications of BCG vaccination

1. Abscess and ulcer may develop at the site of injection. It is mainly due to faulty techniques and should be treated with needle aspiration, use of broad-spectrum antibiotics, and applying aseptic dressing.
2. Keloid is the excessive scarring at the site of injection and need referral to a surgeon or dermatologist.
3. Fever, rashes and enlarged lymph nodes that need to be handled with reassurance, antipyretics and referral to medical officer.
4. Osteomyelitis and TB of skin.

Other uses of BCG

1. In leprosy BCG has 26% protective effect.
2. Burceli ulcer can be prevented.
3. Cancer immunotherapy: For bladder cancer, and colorectal cancer BCG is used as adjuvant to many other cancer vaccines.
4. Diabetes Type 1: BCG induces production of TNF alfa which can kill the T cells responsible for DM type 1.
5. Intertitial Cystitis/Painful bladder syndrome is due to unknown chronic inflammation improved by immunotherapeutic agent.
6. Multiple sclerosis: BCG reduces recurrence.

Nutrition and Tuberculosis

Malnutrition and tuberculosis are both problems of considerable magnitude in most of the underdeveloped regions of the world. These two problems tend to interact with each other. Tuberculosis mortality rates in different economic groups in a community tend to vary inversely with their economic levels. Similarly, nutritional status is significantly lower in patients with active tuberculosis compared with healthy controls. Malnutrition can lead to secondary immunodeficiency that increases the host's susceptibility to infection. In patients with tuberculosis, it leads to reduction in appetite, nutrient malabsorption, micronutrient malabsorption, and altered metabolism leading to wasting. Both, protein-energy malnutrition and micronutrients deficiencies increase the risk of tuberculosis. It has been found that malnourished tuberculosis patients have delayed recovery and higher mortality rates than well-nourished patients. Nutritional status of patients improves during tuberculosis chemotherapy. High prevalence of human immunodeficiency (HIV) infection in the underdeveloped countries further aggravates the problem of malnutrition and tuberculosis. Nutritional supplementation may represent a novel approach for fast recovery in tuberculosis patients. In addition, raising nutritional status of population may prove to be an effective measure to control tuberculosis in underdeveloped areas of world (Gupta et al 2009)

In general population a TB patient should take a balanced diet which is affordable to him/her. Suppose a patient can afford only Dal/Chapati then encourage him/her to increase the quantity of Dal; if he or she was taking half katori then he can increase it and take one katori of Dal along with seasonal fruits and vegetables because these items will be more nutritious as well as cheaper than other food items.

At the same time some of pulses like Moong and Kala Chana can be sprouted to add up to more of Vitamin C and folic acid without spending any money. These patients should not skip any meal – Breakfast, midday meal, lunch and dinner. Even if patient does not feel like eating, then also during mealtime he should try to take meal, and should not remain empty stomach.

Avoid alcohol and tobacco – A TB patient should not take alcohol or tobacco during the course of treatment because it inhibits the action of ATT drugs. For example, an alcoholic TB patient taking medicines regularly and complaints that he is not having any improvement even if he is regularly taking medicines. It is happening because he is simultaneously taking alcohol or tobacco along with ATT drugs. That is why there is no improvement in his condition. The other reason for avoiding alcohol and tobacco is that these substances affect liver along with ATT drugs. If a patient takes alcohol or tobacco as well as takes all ATT drugs, then his damage of liver would be earlier. Hence, a TBHV should always guide these patients why to stop taking alcohol or tobacco during the course of treatment.

Tuberculosis and Diabetes

The recent medical literature shows interactions between Tuberculosis and Diabetes. People with diabetes have a 2-3 times higher risk of TB compared to people without diabetes. About 10% of TB cases globally are linked to diabetes. DM can lengthen the

time to sputum culture conversion and theoretically this could lead to the development of drug resistance if a 4-drug regimen in the intensive phase of therapy is changed after 2 months to a 2-drug regimen in the presence of culture-positive TB. People with diabetes who are diagnosed with TB have a higher risk of death during TB treatment and of TB relapse after treatment.

Disposal of Sputum

Safe disposal of sputum or soiled bamboo stick or slide is also necessary task for the health care worker. Sputum can be disinfected in 5% hypochlorite solution or 5% phenol. Similarly other material can also be submerged in hypochlorite solution. Autoclave is another acceptable method. Ultraviolet light kills TB germs. Sun is the cheap source of UV light and patient's clothes and bed linen must be exposed to sun. Floors should not be swept dry rather wet mopped.

In Hospital/Nursing Home/Health Center: Sputum sample containers should be made of Non-PVC and put in yellow bag for incineration. If containers are made of PVC or glass, it should be disinfected in autoclave. If autoclave is not available, it can be disinfected by hypochloride solution or cresol and diluted disinfected sputum can be discarded in drain. Container can be kept in black bag to discard as general solid waste. These sputum containers should not be reused because the dead bacilli can give false positive results.

In Household: There are many options depending on situation and ability of the household. 1) Over night sputum should be diluted in water and boiled in steel container and discard in drain. 2) Sputum can be kept in ash and buried under the sand. 3) Sputum can be disinfected treated with chemicals such as hypochloride solution or cresol and later can be discarded in drain.

INTERNATIONAL STANDARDS FOR TB CARE (ISTC)

The standard have been developed by the Tuberculosis Coalition for Technical Assistance (TBCTA). The RNTCP of the Government of India conforms to the standards prescribed in the ISTC.

Standards for Diagnosis

Standard 1: All persons with otherwise unexplained productive cough lasting two weeks or more should be evaluated for tuberculosis.

Standard 2: All patients (adults, adolescent, and children who are capable for producing sputum) suspected of having pulmonary tuberculosis should have at least two sputum specimens obtained for microscopic examination. When possible, at least one early morning specimen should be obtained.

Standard 3: For all patients (adults, adolescents, and children) suspected of having extra-pulmonary tuberculosis, appropriate specimens from the suspected sites of involvement should be obtained for microscopy and, where facilities and resources are available, for culture and histopathological examination.

Standard 4: All persons with chest radiographic findings suggestive of tuberculosis should have sputum specimens submitted for microbiological examination.

Standard 5: The diagnosis of sputum smear-negative pulmonary tuberculosis should be based on the following criteria: at least two negative sputum smears (including at least one early morning specimen); chest radiography findings consistent with tuberculosis; and of response to a trial of broad spectrum antimicrobial agents. Because the fluoroquinolones are active against M. tuberculosis and thus, may cause transient improvement in persons with tuberculosis, they should be avoided. In persons with known or suspected HIV infections, the diagnosis evaluation should be executed.

Standard 6: The diagnosis of intrathoracic (i.e. pulmonary, pleural, and mediastinal or hilar lymph node) tuberculosis in symptomatic children with negative sputum smears should be based on the finding of chest radiographic abnormalities consistent with tuberculosis and either a history of exposure to an infectious case or evidence of tuberculosis infection (positive tuberculin skin test or interferon gamma release assay). For such patients, if facilities for culture are available, sputum specimens should be obtained (by expectoration, gastric washing, or induced sputum) for culture.

Standards for Treatment

Standard 7: Any practitioner treating a patient for tuberculosis is assuming an important public health responsibility. To fulfill this responsibility the practitioner must not only prescribe an appropriate regimen but also to capable of assessing the adherence of the patient to the regimen and addressing poor adherence when it occurs. By doing so, the provider will be able to ensure adherence to the regimen until treatment is completed.

Standard 8: All patients (including those with HIV infection) who have not been treated previously should receive an internationally accepted first-line treatment regimen using drugs of known bioavailability. The initial phase should consist of two months of isoniazid, rifampicin, pyrazinamide, and ethambutol. The preferred continuation phase consists of isoniazid and rifampicin given for four months. Isoniazid and ethambutol given for six months is an alternative continuation phase regimen that may be used when adherence cannot be assessed, but it is associated with a higher rate of failure and relapse, especially in patients with HIV infection. The doses of antituberculosis drugs used should conform to international recommendations. Fixed dose combinations of two (isoniazid and rifampicin), three (isoniazid, rifampicin, pyrazinamide) and four (isoniazid, rifampicin, pyrazinamide and ethambutol) drugs are highly recommended, especially when medication ingestion is not observed.

Standard 9: Supervision and support should be gender-sensitive and age-specific and should draw on the full range of recommended interventions and available support services, including patient counseling and education. A central element of the patient-centered strategy is the use of measures to assess and promote adherence to the treatment regimen and to address poor adherence when it occurs. These measures should be tailored to the individual's circumstances and be mutually acceptable to the patient and the provider. Such measures may include direct observation of medication ingestion (DOTS) by the treatment support who is acceptable and accountable to the patient and to the health system.

Standard 10: All patients should be monitored for response to therapy, best judged in patients with pulmonary tuberculosis by follow-up sputum microscopy (two specimens) at least at the time of completion of the initial phase of treatment (two months), at five months, and at the end of treatment. Patients who have positive smear during the fifth month of treatment should be considered as treatment failures and have therapy modified appropriately. In patients with extrapulmonary tuberculosis and in children, the response to treatment is best assessed clinically. Follow-up radiographic examinations are usually unnecessary and may be misleading.

Standard 11: A written record of all medications given, bacteriologic response, and adverse reactions should be maintained for all patients.

Standards 12: In areas with a high prevalence of HIV infection in the general population and where tuberculosis and HIV infection are likely to coexist, HIV counseling and testing is indicated for all tuberculosis patient as part of their routine management. In areas with lower prevalence rates of HIV, HIV counseling and testing is indicated for tuberculosis patients with symptoms and /or signs of HIV related conditions and in tuberculosis patients having a history suggestive of high risk of HIV exposure.

Standard 13: All patients with tuberculosis and HIV infection should be evaluated to determine if antiretroviral therapy indicated during the course of treatment. Appropriate arrangements for access of antiretroviral drugs should be made for patients who meet indications for treatment. Given the complexity of co-administration of antituberculosis treatment and antiretroviral therapy consultation with a physician who is expert in this area is recommended before initiation of concurrent treatment for treatment and HIV infection, regardless of which disease appeared first. However, initiation of treatment for tuberculosis should not be delayed. Patients with tuberculosis and HIV infection should also receive cotrimoxazole as prophylaxis for other infections.

Standard 14: As assessment of the likelihood of drugs resistance based on history of prior treatment, exposure to a possible source case having drug-resistance organisms, and the community prevalence of drug resistance, should be obtained for all patients.

Patients who fail treatment and chronic case should always be assessed for possible drug resistance: where it is considered to be likely, culture and drug susceptibility testing for isoniazid, rifampicin, and ethambutol should be performed promptly.

Standard 15: Patients with tuberculosis caused by drug-resistance (MDR) organisms should be treated with specialized regimens containing second-line ATT drugs. At least four drugs to which the organisms are known or presumed to be susceptible should be used, and treatment should be given for at least 18 months. Patient-centered measures are required to ensure adherence. Consultation with a provider experienced in treatment of patients with MDR TB should be obtained.

Standard for Public Health Responsibility

Standard 16: All providers of care for patient with TB should ensure that persons (especially children under 5 years of age and persons with HIV infection) who are in close contact with patients who have infectious TB are evaluated and managed in line with international recommendations.

Standard 17: All providers must report both new and retreatment TB cases and their treatment outcomes to local public health authorities, in conformance with applicable legal requirements and policies.

It is imperative that professional bodies endorse the ISTC and commit that all health care providers shall give care to their TB patients as per the international standards. The important next step ahead for health professional in the country is to take these standards to all professional bodies, and through them to all medical practitioners, and seek their commitment to their international standards, which is also their commitment to the principles of RNTCP.

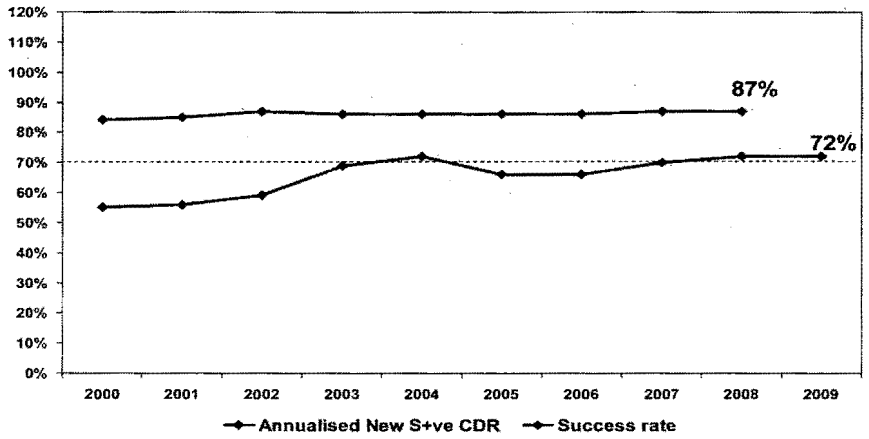
Comments

This strategy has a problem. If program sustain, medical practitioners need to take into confidence. They may demand free drugs from government or such strategy may hinder them to take part because of their commercial interest.

PROGRESS OF THE RNTCP

- 1992: National Program review of tuberculosis concluded that efforts to control the disease had not made any significant impact.
- 1993: Revised National TB Control Program was initiated, applying the principles of DOTS.
- 1997: Govt. of India obtained a "soft" loan from the World Bank of US $ 142 million to implement the RNTCP in at least one third of the country and to prepare the rest of the country for implementation of RNTCP at a later date. Beside the World Bank, DANIDA, SIDA and Department for International Development (DFID) are supporting the program.
- 1999: RNTCP expands 7 fold to become the second largest such program in the world and covered 130 million population.
- 2001: 430 million population in 190 district is already covered.
- 2004 October: Population of 909 million (83% of total population) in 524 districts of 22 states and UTs is fully covered.
- 2005: It is claimed that 1080 million of the country population in 607 districts have been covered under the program.
- In March 2006 whole country (1114 million) is covered.
- In the year 2005, the program had achieved a case detection rate of 66% as against the global target of 70% and treatment success achieved consistently above 83%.
- Electronic connectivity with all district TB centers established for effective MIS.
- RNTCP has been recognized for the fastest expansion of DOTS in the world, with over 55-fold expansion in RNTCP coverage since 1998, leading to total coverage of the country in March 2006.
- During the year 2009, new sputum positive case detection rate of 70% and treatment success rate of 86% was achieved (Figure 9.11).
- Diagnostic facilities have been established in >12,000 laboratories throughout the country. As a result, the proportion of sputum positive cases confirmed in the laboratory are now double that of the previous program and are on par with international standards.
- RNTCP has successfully involved 261 medical colleges, over 2900 NGOs, 17000 Private Practitioners and over 150 corporate sector health units.

Figure 9.11: Annualized New Smear-Positive Case Detection Rate and Treatment Success Rate in DOTS Areas, India, 2000-2009*



* Population projected from 2001 census
* Estimated no. of NSP cases - 75/100,000 population per year (based on recent ARTI report)
*Annualized for 2009 from data of 3 quarters

- Quality Assurance protocol for smear microscopy has been implemented in all the states.
- In 2007 alone, more than 58,000 care providers have been trained.
- Sound training materials have been developed for all categories of staff.
- About 140 internal evaluations have been conducted in 2007.

DOTS Plus

- DOTS Plus services for the management of MDR-TB patients have been rolled out in the states of Gujarat and Maharashtra in 2007.
- Two intermediate reference laboratories (IRL) have been established and accredited (one each in the states of Maharashtra and Gujarat) to carry out quality assured culture and Drug Susceptibility Testing (DST) for diagnosis of MDR-TB.
- Eleven other such State laboratories have been established and are in the process of accreditation.
- Another 13 State IRLs are in the process of being established. This will ensure atleast one quality assured C&DST testing lab per major state for the diagnosis and follow-up of MDR-TB patients.

TB-HIV Collaboration

- TB-HIV collaborative activities have been scaled up in all states in the country.
- Joint training modules on TB/HIV have been formulated for various categories of staff of RNTCP and NACP and training activities are being scaled-up.
- ART-DOTS linkages are being established at all the ART centres of HIV/AIDS control program to ensure optimal access to TB diagnostic and treatment services by HIV infected persons attending these centres.

Impact of the Program

- TB mortality in the country has decreased from over 5 lakh deaths per annum at the beginning of the program to around 322,000 deaths per annum at present.
- National estimates of Annual Risk of Tuberculosis Infection (ARTI) prior to 2000 were 1.7% and estimates based on National ARTI survey in 2001-03 are 1.5%, and 1.1% in 2007-10.
- Repeat disease prevalence surveys conducted by TRC in its field research area indicate an annual decline in prevalence of disease by 12%. Disease prevalence surveys have been initiated at 6 other sites across the country this year.

Other Activities

- Scaling up of the state level intermediate referral laboratories (IRL) capacity for nationwide implementation of external quality assessment (EQA) of sputum smear microscopy services and provision of culture and drug sensitive testing.
- Operational Research priority areas identified and action plan developed for dissemination of results of these studies.

- Five meetings of the Zonal Task Force (ZTF) and a meeting of the National Task Force (NTF) for enhancing the involvement of medical colleges were held during the year. NTF endorsed statement on rational use of second line drugs and agreed to the contents of the consensus statement on MDR & XDR TB.
- Workshop on training methodology for revision and update of training material held in Chennai.
- National Consultation on revision of NGO/PP Guidelines held in January 2008.

Achievements of RNTCP

1. RNTCP has evaluated over 55 million persons for TB and initiated treatment for over 15.8 million TB patients.
2. Prevention of mortality has been biggest achievement of RNTCP saving more than 2.8 million lives.
3. Having achieved national coverage, with special emphasis to areas classified as Tribal and/or Backward, RNTCP is well on track to achieve the Millennium Development Goal (MDG) of halting and beginning to reverse the spread of the disease.
4. The RNTCP and National AIDS Control Programme have significantly expanded joint TB/ HIV services, which are currently available in 18 states with the aim to cover all states by 2012.
5. A national lab scale-up plan with secured funding to establish a network of culture and DST laboratories is in place. By 2010, MDR-TB services were available in 132 districts in 12 states and the programme had diagnosed and provided treatment to almost 4217 MDR-TB patients till quarter ending March 2011, with a vision for nationwide coverage by 2012.
6. Medical college involvement has been largely successful. Efforts to engage the private sector have revolved around outreach, directly via public-private mix (PPM) schemes and through intermediary groups such as the Indian Medical Association (professional organization) and Catholic Bishop Conference of India (CBCI, a faith based organization).
7. A major initiative to expand the role of civil society and affected communities in TB care and control is currently underway for 2010 – 2014, supported by a grant from the Global Fund directly to civil society partners.
8. Repeat ARTI surveys suggest the Annual Risk of TB Infection in the country has reduced from the national average of 1.5% to 1.1% since 2002-03 to 2007-10 showing a decline of 3.5% annually. With successful implementation of RNTCP the decline in ARTI is indicative of reduction in incidence of TB in India. If we apply this ARTI for incidence estimation, it suggests that the incidence of New Smear Positive TB cases has reduced from 75 per lakh population to 55 per lakh population. While the incidence of all types of TB cases is then estimated to be around 121 per lakh population.
9. While the indirect estimate of prevalence of the disease by WHO suggest that around 3 millineum TB cases are prevalent in India currently. The trend in estimated prevalence of TB suggest >50% reduction from its 1990 level of 583 per lakh population to around 250 per lakh population.

RNTCP in 12th five year plan

RNTCP has entered in an ambitious National Strategic Plan (NSP) 2012-17 as part of the country's 12th Five year Plan. The theme of the NSP 2012-17 is "Universal Access for quality diagnosis and treatment for all TB patients in the community" with a target of "reaching the unreached".

Vision:

The vision is a "TB-free India - through achieving Universal Access by provision of quality diagnosis and treatment for all TB patients in the community".

Goal:

To decrease the morbidity and mortality by early diagnosis and early treatment to all TB cases thereby cutting the chain of transmission.

Objectives:

- Early detection and treatment of at least 90% of estimated all type of TB cases in the community, including Drug resistant and HIV associated TB.
- Successful treatment of at least 90% of new TB patients, and at least 85% of previously-treated TB patients

- Reduction in default rate of new TB cases to less than 5% and re-treatment TB cases to less than 10%
- Initial screening of all re-treatment smear-positive till 2015 and all Smear positive TB patients by year 2017 for drug-resistant TB and provision of treatment services for MDR-TB patients;
- Offer of HIV Counseling and testing for all TB patients and linking HIV-infected TB patients to HIV care and support;
- Extend RNTCP services to patients diagnosed and treated in the private sector.

Targets:

- Detection & treatment of about 87 lakh Tuberculosis patients during 12th FYP
- Detection & treatment of at least 2 lakh MDR-TB patients during 12th FYP
- Reduction in delay in diagnosis and treatment of all types of TB cases
- Increase in access to services to marginalized and hard to reach populations and high risk and vulnerable groups

Strategies

- Ensuring early and improved diagnosis of all TB patients, through improving outreach, vigorously expanding case finding efforts among vulnerable populations, deploying better diagnostics, and by extending services to patients diagnosed and treated in the private sector.
- Improving patient-friendly access to high-quality treatment for all diagnosed cases of TB, including scaling up treatment for MDR-TB nationwide.
- Re-engineering program systems for optimal alignment with NRHM at block level and human resource development for all health staffs.
- Enhancing supervision, monitoring, surveillance, and program operations for continuous quality improvement and accountability for each TB case, with program-based research for development and incorporation of innovations into effective program practice.

Important activities under the 12th five year plan:

1. **Alignment of basic RNTCP sub-district management units with NRHM blocks** for strengthening supervision and monitoring. Till now there were 1 "Tuberculosis Units" (TU) of 5 lakh population for reporting, monitoring and supervision, now these will be aligned at 1 per NRHM health blocks. The number of Senior Treatment Supervisor (STS) would be increased accordingly, to operate under Block Medical Officer.

2. **Human Resources:**

a. **National Level:** 116 contractual positions in areas such as Epidemiology, Microbiology, Drug Resistance, TB-HIV, Public Private Mix, ACSM, Information Technology, Finance, Accounts, Procurement, Administration, Biostatistics, HRD, Monitoring, Evaluation, Research & Public Health are proposed in 12th FYP at national level institutes (Central TB Division, National Reference Laboratories, Office of Regional Directorates).

b. **State Level:** States/UTs would be provided consultants in areas such as Epidemiology, Microbiology, Drug Resistance, TB-HIV, Public Private Mix, ACSM, Information Technology, Finance, Accounts, Procurement, Administration, Monitoring, Evaluation, Research & Public Health. This will include the requirements of state level institutes (State TB Cell, State TB Demonstration & Training Centres-STDCs, Intermediate Reference Laboratories(IRL), State & Zonal task forces of medical colleges) etc.. States with populations exceeding 30 million will be eligible for additional manpower.

c. **District Level:** Every district would be supported with Medical officer, District Program Coordinator, PPM Coordinator, Drug Resistance TBHIV supervisor, LTs, Data Entry Operator, Accountant, TBHV (per 1 lakh urban population), MO/LT/TBHV for Government Medical College / Government Hospitals with DNB courses as per need, Medical officer /Counselors/statistical assistant for DRTB Centre. For private hospitals detailed guidelines & criteria's will be framed and will be submitted for approval to the Ministry of Health & Family Welfare.

Districts with population exceeding 4 million will be eligible for additional manpower.

3. **Laboratories/Diagnosis:**

a. **Improved Diagnosis** – the network of existing 13000 designated microscopy centres (DMCs) will be upgraded and rationalized. States and districts will be allowed flexibility to increase DMCs as per local need. The LED FM microscopes will be provided to all DMCs with high workload.

b. **Universal Drug-Susceptibility Testing**: Testing for Multi-Drug Resistance TB (MDRTB) will be made available to all MDR suspects through decentralization of testing for MDRTB at district hospitals / district TB centers and all hospitals attached with government medical colleges using rapid tests. These Rapid automated molecular tests will be made available in each district hospital and hospital attached with government medical colleges.

c. **Scale-up of Reference Laboratories:** The laboratories capable of conducting culture & drug susceptibility would be scaled up from 43 (one per 25 million population) to an achievable 120 (one per 10 million population) with requisite infrastructure, equipment & HR support.

4. **Urban TB Control:**

In the urban areas TB control program will be aligned with Urban Health Mission. The Tuberculosis unit is proposed for 1 per 1-2.5 lakh population in urban areas for intensifying TB control activities.

5. **Public Private Mix (PPM):**

The current and proposed NGO-PP schemes will be implemented with suitable revised financial norms. It is proposed that engagement of the private sector be enhanced through an outsourced mechanism based on the needs of the program at central and state and district levels.

Recent Policy updates under RNTCP:

1. A new system of Monitoring of programme through Composite Indicator introduced which enables the monitoring of input, process and outcome indicators.
2. Revision of Supervision and Monitoring Strategy was undertaken to address the new needs.
3. Notification of all TB cases diagnosed and treated by practitioners and the other health establishments.
4. The manufacture, sale, distribution, use and import of the Sero-diagnostic test kits for tuberculosis in India, has been banned
5. Guidelines for "Programmatic Management of Drug Resistant Tuberculosis" were revised wherein diagnostic & treatment guidelines were also included for XDR and XDRTB patients having ofloxacin resistance.
6. All TB suspects to be screened for HIV in the high prevalence states
7. All TB patients to be screened for Diabetes
8. Guidelines for management of Pediatric TB cases were revised introducing Newer Diagnostic Algorithm and Weight Bands.
9. Single window services for TB-HIV coinfected patients: RNTPC in collaboration with National AIDS Control Program (NACP) and technical support from World Health Organization country office for India is currently implementing a project 'Intensified TB case finding and appropriate treatment' at selected 30 high burden ART centres in five states of India from April 2015. The project focuses on comprehensive strategies to reduce the burden of TB among People living with HIV AIDS (PLHA) with single window service delivery for TB and HIV, rapid diagnosis with CBNAAT, AIC measures at ART center and Fixed Dose Combination daily therapy.
10. Introduction of Daily Regimen for treatment of Drug Sensitive TB under RNTCP- To be implemented in 5 states in India.
11. Scale-up of use of Cartridge based nucleic acid amplification test (CBNAAT) machines.
12. Introduction of newer anti-TB drug - Bedaquiline: The new drug Bedaquiline is being introduced in six referral sites initially to establish its safety profile among Indian patients.
13. TB and Comorbidities (NPCDCS and Tobacco): RNTCP and National Program for Prevention and Control of Cancer, Diabetes, CVD & Stroke (NPCDCS) have jointly developed a framework for collaboration which aims to reduce morbidity and mortality by doing bi-directional screening, early detection and prompt management of Diabetes Mellitus (DM) and TB.

THE GLOBAL PLAN TO STOP

TUBERCULOSIS

WHO Initiative was launched at the World Lung Health Conference in Bangkok in Nov. 1998 and endorsed the Amsterdam Declaration to Stop Tuberculosis held in 2000 by World Health Assembly. Initiatives recommended to all member states are:

1. Should participate with WHO in the global partnership to stop tuberculosis, and establish and sustain country level partnerships for: (a) study of antituberculosis drug resistance and means of its containment; (b) improvement of diagnostic laboratories; (c) access to antituberculosis drugs for the poorest populations; (d) education and monitoring of patients to ensure better compliance with the treatment regimens; (e) training of health workers in the DOTS strategy; (f) integration of tuberculosis control into primary health care institutions and activities at the central and peripheral level;
2. Include case detection and treatment success rates-basic outcomes and performance measures for tuberculosis and overall health development;
3. Continue to assess the magnitude of the impact of the AIDS epidemic on the tuberculosis epidemic and develop strategies to better address tuberculosis in HIV/AIDS patients.

A call on international community, organizations and bodies of the United Nations system, donors, non-governmental organizations and foundations to support and to participate in stopping tuberculosis.

The stop TB Partnership has developed a **Global Plan to Stop TB** that covers the period 2006-2015.

Vision

The Stop TB Partnership's vision is a TB free world.

Mission

- To ensure that every TB patient has access to effective diagnosis, treatment and cure;
- To stop transmission of TB;
- To reduce the inequitable social and economic toll of TB;
- To develop and implement new preventive, diagnostic and therapeutic tools and strategies to stop TB.

Targets

- By 2005, and to be sustained or exceeded by 2015: at least 70% of people infectious TB will be diagnosed (i.e. under the DOTS strategy) and at least 85% of those diagnosed will be cured.
- By 2015: the global burden of TB disease (disease prevalence and deaths) will be reduced by 50% relative to 1990 levels. Specifically, this means reducing prevalence to 155 or fewer per 100,000 population and reducing deaths to 14 or few per 100,000 per year by 2015, including people co-infected with TB and HIV. The number of people dying from TB in 2015 should be less than 1 million.
- By 2050: TB will be eliminated as a global public health problem. Using the criterion for TB elimination adopted in the USA, this means that the global incidence of TB disease will be less than 1 per million population.

Stop TB Strategy

The **six components** of the Stop TB Strategy are:

1. **Pursuing high-quality DOTS expansion and enhancement.** Making high-quality services widely available and accessible to all those who need them, including the poorest and most vulnerable, requires DOTS expansion to even the remotest areas. In 2004, 183 countries (including all 22 of the high-burden countries which account for 80% of the world's TB cases) were implementing DOTS in at least part of the country.
2. **Addressing TB/HIV, MDR-TB and other challenges.** Addressing TB/HIV, MDR-TB and other challenges requires much greater action and input than DOTS implementation and is essential to achieving the targets set for 2015, including the United Nations Millennium Development Goal relating to TB (Goal 6; Target 8).
3. **Contributing to health system strengthening.** National TB control programs must contribute to overall strategies to advance financing, planning, management, information and supply systems and innovative service delivery scale-up.
4. **Engaging all care providers.** TB patients seek care from a wide array of public, private, corporate and voluntary health-care providers. To be able to reach all patients and ensure that they receive high-quality care, all types of health-care providers are to be engaged.
5. **Empowering people with TB, and communities.** Community TB care projects have shown how people and communities can

undertake some essential TB control tasks. These networks can mobilize civil societies and also ensure political support and long-term sustainability for TB control programs.

6. **Enabling and promoting research.** While current tools can control TB, improved practices and elimination will depend on new diagnostics, drugs and vaccines.

The strategy is to be implemented over the next 10 years as described in The Global Plan to Stop TB, 2006–2015. The Global Plan is a comprehensive assessment of the action and resources needed to implement the Stop TB Strategy and to achieve the following targets:

- Millennium Development Goal (MDG) 6, Target 8: Halt and begin to reverse the incidence of TB by 2015
- Targets linked to the MDGs and endorsed by the Stop TB Partnership:
  - by 2005: detect at least 70% of new sputum smear-positive TB cases and cure at least 85% of these cases
  - by 2015: reduce TB prevalence and death rates by 50% relative to 1990
  - by 2050: eliminate TB as a public health problem (1 case per million population).

THE END TB STRATEGY (2016-2035)

VISION - A WORLD FREE OF TB — zero deaths, disease and suffering due to TB

GOAL - end the global TB epidemic

PRINCIPLES

1. Government stewardship and accountability, with monitoring and evaluation
2. Strong coalition with civil society organizations and communities
3. Protection and promotion of human rights, ethics and equity
4. Adaptation of the strategy and targets at country level, with global collaboration.

Indicators are given in table 9.8 for the end TB strategy

Components

1. INTEGRATED, PATIENT-CENTRED CARE AND PREVENTION
   - Early diagnosis of TB including universal drug-susceptibility testing, and systematic screening of contacts and high-risk groups
   - Treatment of all people with TB including drug-resistant TB, and patient support
   - Collaborative TB/HIV activities, and management of co-morbidities
   - Preventive treatment of persons at high risk, and vaccination against TB
2. BOLD POLICIES AND SUPPORTIVE SYSTEMS
   - Political commitment with adequate resources for TB care and prevention
   - Engagement of communities, civil society organizations, and public and private care providers
   - Universal health coverage policy, and regulatory frameworks for case notification, vital registration, quality and rational use of medicines, and infection control
   - Social protection, poverty alleviation and actions on other determinants of TB
3. INTENSIFIED RESEARCH AND INNOVATION
   - Discovery, development and rapid uptake of new tools, interventions and strategies
   - Research to optimize implementation and impact, and promote innovations

COMMENTS ON THE RNTCP

1. RNTCP is based on critical evaluation of NTC which has adopted victim blaming approach rather than improving existing NTC policy and program (Giri S 2006).
2. **Targets** are set low both for coverage and cure because 85% of cure of those who are on treatment has been recommended whereas only 50%-60% of the patients come to the government health facility for their illness. If there is any deviation from the targets, the situation will be undesirable and dangerous. Target of 85% cure and 70% case detection by 2005 and universal coverage by 2006 which have been achieved and continued in subsequent years upto 2013. This is not uniform. There is less case detection in some areas and need much greater efforts because neither all cases come to the government health facilities and nor active detection, and involvement of private practitioners and hospitals ensured under

Table 9.9: Indicators for the program

INDICATORS	MILESTONES		TARGETS	
	2020	2025	SDG 2030	END TB 2035
Reduction in number of TB deaths compared with 2015 (%)	35%	75%	90%	95%
Reduction in TB incidence ratecompared with 2015 (%)	20% (< 85/lakh)	50% (<55/lakh)	80% (<20/lakh)	90% (<10/lakh)
TB-affected families facing catastrophic costs due to TB	0%	0%	0%	0%

the program. Death and failure in new smear positive remained same through the decade as given table 9.11.

Most important is stagnant of achievement since 2006 and no decrease in death rate and default rate. India is getting soft loan from the World Bank and need to be repayed. There is question of sustainability of program in coming times.

3. Universal coverage with DOTS is not desirable. There are around 1-2% patients who required non-DOTS regimen because of drug intolerance, drug toxicity, liver disease, immunocompromized state of ART and migration (Pardeshi & Deshmukh 2009). Such number could be more in some particularly regions where alcoholism or drug addiction is common. Either DOTS should be provision to accommodate such cases or allow other regimens.
4. Involving Private Practitioners particularly Indian Medical Association in the program has been initiated through various schemes however there is hardly any improvement in their cooperation in case reporting and treatment according to guidelines. There is no provision for treatment for patients who came to enroll for DOTS after taking treatment for sometime from private practitioners.
5. Poor smear positive case detection was found in China (Chen 2002) and other settings and will remain a challenge. According to Dye the target of 70% case detection will not be reached until 2013 (Dye 2002). However, there is an attempt in this direction to involve various sectors in RNTCP. India on an average has reached to the targets but sustaining these target is must.
6. Around 40%-50% of active pulmonary TB (Culture positive) can not be detected by **sputum microscopy** (Nagpaul 1968). This can be achieved by improving the quality of sputum microscopy and application of better diagnostic tests, however, these undetected smear negative patients will be left untreated if x-rays is also negative which may continue to infect people in the community. Not providing any treatment in their suffering further lead to loss of faith in government health services. It is logical to put Category III into I in new guidelines.

More reliable methods for diagnosis are required. For example, to detect more cases alternative methods and innovative ideas are required to be experimented. In Tanzania such experiment was carried out on rats. Rats - HeroRATS - were trained by the organization APOPO to detect landmines and were successfully able to eliminate the problem. Similarly African giant pouched rats were trained to detect pulmonary tuberculosis. In reality, it is a novel and alternative tool to enhance case detection in resource limited settings, at higher speed, smaller cost, and lower levels of skills in the operators. Moreover, this approach doesn't require any hi-tech equipment, or

Table 9.11: Indiactors among new smear positive cases

	New Smear-positive			
Year	Success	Death	Failure	Default
1999	82%	5%	3%	9%
2000	84%	4%	3%	8%
2001	85%	5%	3%	7%
2002	87%	4%	3%	6%
2003	86%	5%	2%	6%
2004	86%	4%	2%	7%
2005	86%	5%	2%	7%
2006	86%	5%	2%	6%
2007	87%	5%	2%	6%
2008	87%	4%	2%	6%

Source: RNTCP Status report 2010, TBC India

expensive reagents. Whereas a trained lab technician can process a maximum of 40 sputum samples in a day, a HeroRAT can discriminate the same amount of samples in 7 minutes only. A HeroRAT can diagnose pulmonary TB at 86 percent sensitivity and 89 percent specificity, or an overall reliability of 87 percent, compared to traditional sputum smear microscopy which reaches an alarming overall reliability of only 37 percent in Tanzania (Global health magazine).

Nuclear Acid Amplification tests (NAATs) can amplify even the smallest amount of genetic material of TB bacilli but such tests are costly. Immunological test such as cytokine profiling panels have been explored. More tests should be developed for quick diagnosis.

Gene Xpert test should be made available for early detection of MRD.

7. Majority of patients on ATT did not recover from the **chest symptoms**, which used to develop a sense of dissatisfaction. Program doesn't emphasize on the active health education and appropriate counseling of the patient throughout the treatment and in follow-up.
8. Since the advent of chemotherapy, **many changes** have taken place. Drug combinations and dosages have been varied and the rhythm of administration and duration of treatment have changed over the years. This has created confusion amongst all physicians particularly private practitioners who are engaged in practice for a long time. That could be the reason of hundred types of regimens for tuberculosis patient advocated by them. In a recent study it was found that almost 60% of dosages being prescribed to patients suffering from tuberculosis in India don't correspond with standard treatment guidelines. There were 70 different first line TB drug dosages and combination prevalent in India's private sector. However, 14 were necessary. Incorrect proportion of drugs in fixed doses combination being sold is a significant issue in India. According to clinicians there is no regimen under DOTS for extra pulmonary TB which requires treatment for around 18 months. These patients face problems for treatment completion.
9. Regarding intermittent supervised treatment which was initiated in 1960s, most of the private practitioners gave INH daily and streptomycin twice weekly. This resulted in emergence of resistance to INH first and to streptomycin subsequently. Thus this can not be ensured that a similar "mishap" will not occur now with DOTS strategy (Volmink et al 2000).
10. **Initial drug resistance** among the TB patients is another difficulty in the success of chemotherapy. As most of the patients are receiving ATT out side (from Private Practitioners) they are potential cases for drug resistance. Initial drug resistance is 18% (8%-27%). In some cases the acquired drug resistance is as high as 25%-100% (Jain et al. 1992, Menon S, et al 2012). They are put on five drugs (Category II regimen) without culture and drug sensitivity testing thus, they have a higher chances of failure. Drug sensitivity testing should be included as one of the diagnostic criteria in tertiary centers rather than changing all centers to DOTS strategy. But such facilities are not available in most places.
11. In case of category I failure, one more drug is added whereas it is always suggested that at least **three drugs should be added** in the regimen to which the patient's bacilli are susceptible (Hayward 1996). In such cases drug sensitivity testing is very essential. MDR patients are increased in number.
12. As majority of TB patients are of poor socioeconomic status and cannot afford to second line drugs, Multidrug resistance TB patients are left for their destiny whereas these patients are definitely a threat to the community. Another problem is free availability of second line drugs in market and private practitioners are already using them indiscriminately. This will definitely increase the multi-drug resistance TB. DOTS plus has been started in some districts and its sustainability need to be seen.
13. **Relapse rate:** Higher relapse is found in smokers. The program should focus on anti-smoking campaign and smoker TB patients should also get anti-smoking counseling.
14. **Regular drug supply** is paramount important factor for the success of DOTS, which require continuous funding from center and international agencies, efficient coordination with manufacturing units, transportation and stores. A lot of managerial and operational skill is required at all level to achieve set objective. Irregular drug

supply and non-availability of ATT drugs were the important reasons for noncompliance (GOI 1992). Central level drug procurement has ensured a continuous supply of drugs. An attempt to decentralize the procurement of loose drugs was made; no states were able to procure the drugs. Sustained procurement of drugs is a big challenge when DOTS Plus need to be implemented. Regular supply of pediatric TB drugs is also a problem. Changing weight bands and their supply needs to be addressed.

15. **Adequate organizational frameworks** satisfying certain operational requirement are of paramount importance in success of chemotherapy. Treatment facility must be easily accessible. Treatment services should be accepted and utilized by the community. Unfortunately, a strong social stigma is attached to TB, which hinders community acceptability of TB treatment in the same community. Drug should always be available in sufficient supply, and whenever possible, treatment should be supervised (Toman 1979). Regular supply of drugs is one of the most important factors in giving good compliance and decreasing drug resistance. For the DOTs strategy, not only adequate drugs supply is to be ensured but also availability of syringes with needles, printed forms, stationary, sputum cups, and laboratories chemicals and their safe disposal are also necessary.
16. Training of doctors in diagnostics skills is also important so that they can differentiate between certain conditions such as silicosis, asbestosis and other environmental toxicity easily. In WHO Report 2005 the availability of trained manpower is lacking in rapidly expanding program. Inclusion of nonmedical personnel for DOTS activities may be risky for the program success. Many of these workers do not know how to inject streptomycin. In a study, it was found that majority of pharmacists were unaware of the existence of the RNTCP and there is slow pace of training to sensitize them about it (Rejeshwari 2002). We have to ensure whether each health worker is aware of DOTS.
17. It has already been observed that **general health services** are reluctant to accept strategies of TB control program. Due to many misconceptions prevailing even amongst health workers they do not want to handle patient's sputum or care about TB patients. Therefore there is a need of in-service-training of these workers to bring change in their attitude about the tuberculosis. Trained TB health visitors are appropriate workers for TB work but unfortunately, training facilities of TB health visitors are not sufficient in the country. Multipurpose workers, ASHA, trained dais and anganwadi workers are already the target of many program strategies and who are supposed to perform numerous other health-related duties. More incentives and promotional avenues should be opened to them if their attention is going to be diverted (Bedi 1997). Government has been imposing compulsory application of DOTS in all government health institutions which could be risky because resistance may develop among specialists of various disciplines. They need to be tactfully convinced for DOTS.
18. Patients reporting to the big hospitals are not referred to DOTS centers because they do not want to loose patients and credit. It is unconventional for a second or tertiary level private hospital to refer their TB patients to a DOTS center, which is a much smaller unit (Chen 2002). In some cases, it has been observed that DOTS centers do not follow the instructions of private or government tertiary care hospital and start the same procedure of diagnosis once again as per standard guidelines. In absence of medical officers at microscopic and DOTS centers such kind of refusal force the patients to go away. In such situations DOTS strategy can not win the faith of patients and higher institutions.
19. Maintaining the quality of TB services is crucial as the program moves towards full coverage with integration with general health services and could be a great challenge for the program managers (WHO Report 2005). DOTS activities poor in some states particularly North Eastern States.
20. **Adherence:** Directly Observed therapy with short course chemotherapy (DOTS) is labeled as the best approach to ensure complete treatment. But the success of this form of observation is likely to depend on how attractive it is to the patient and the observer, not on the act of observation itself. In China it has been made attractive to the observers (Village doctors) through financial incentives (CTCC 1996). The Cost-effectiveness of DOTS in comparison to short course

chemotherapy with health education, and regularity in drug supply is not extensively field tested in Indian situations. In one study it was found that unsupervised intermittent short course chemotherapy with intensive health education gives comparable results (Bhatt 1998). In a randomized controlled trial in Pakistan, DOT with direct observation of treatment by health worker, family member and by self administered gave similar outcomes, with a cure rate of 64% 55% and 62% respectively, and cure or treatment completion rates of 67%, 62% and 65% respectively. None of the three strategies tested was shown to be superior (Walley JD 2001). It has been reported for India that 13% of cohort which is on DOTS is defaulted (WHO 2010).

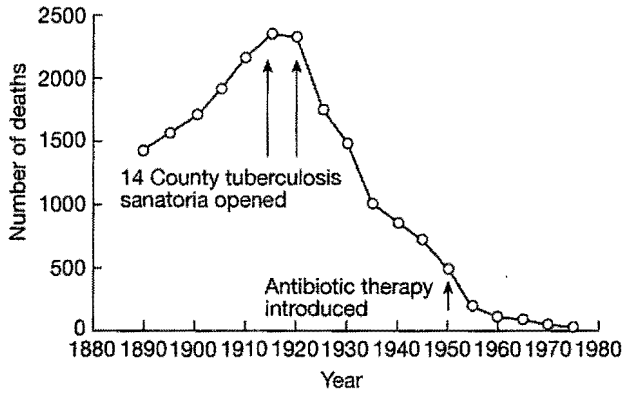
WHO's strategy on DOTS consists of five elements: 1) Incentives, 2) Tracing defaulters, 3) Legal Sanction, 4) Patients centered approaches, 5) staff motivation, supervision and additional external funds. It has been observed throughout the world that the focus is more on adherence and cure rate in DOTS Program. It is the duty of the program manager including WHO to make the explicit range of interventions beside DOTS program (Volmink 2000).

21. There should be more emphasis on community involvement in providing DOTS. Similarly for case finding also community should be involved so that prompt diagnosis and sustained treatment could be achieved (Squire 1997). Getting motivated workers and maintaining their motivation for a long time without any socioeconomic, and professional benefits to the workers is a difficult task in front of management. Health education with other measures like monetary incentives or peer advisers or reminder letters improves adherence even without direct supervision (Paramasivan 1998, Marisky 1990, Sanmarti 1993, Pilote 1996). Success stories of community based intervention from both within the country and other parts of the world need to be replicated if the battle against the century old disease is to be truly won (Hindu 2002).
22. **Short Duration Regimen:** It is well understood that 6-9 months duration regimen although help in reducing noncompliance but not the acceptance level. Further shortening of regimen may be useful. A successful randomized trial has been conducted by TRC Chennai in which 5 drugs-HRZEO (including Ofloxacin) in the initial phase of 3 months and two drugs-HR for 1-2 months was given. High cure rates, low relapse and good tolerance were observed. However, the cost-effectiveness was not studied. Before accepting this at the national level there is a need to further test the regimen at the larger level (TRC 2002).
23. A **social stigma** is attached with TB in our country, which not only inhibits TB patients to come forward for treatment in the early phase of disease but on the other hand health professionals and workers also behave indifferent to this problem. In one study it is found that 72.4% patients were isolated with their utensils in their home. Major source of information in Jharkhand is radio. The major delay in seeking health care from DOTS is stigma (Pathak et al 2008). There is hardly a nationwide **Information Education Communication (IEC)** Program, which is very essential for the change in people's attitude. Half of the population of India is illiterate where effective IEC with a strong national leadership can surely make some dent on the problem as we have observed in case of Immunization Program. Patients are reluctant to come to DOTS center and preferred that whole month doses should be given to them. In many it is the practice that monthly doses are given without supervision (Wafai S Regional Director H&FW J&K, Govt of India 2009 Personal Communication).
24. **Political Commitment**: In the report of WHO 2005 it is mentioned that political commitment is not uniform and a great challenge for reducing the budget gap for TB program. Thus politicians should be involved at central and local level so that they can mobilize resources to the program. Sustained motivation of politician is very important for the program. In presence of rampant corruption all over the system such commitment could be faked.
25. **Community participation and Role of Non-Governmental Organization**: No public health program achieves targets without the help of community. The best program is one that makes the people realize the importance of their health making them self-reliant and able to solve any problem themselves with collective efforts. TB is

a priority problem according to health experts but do the people think in a same way? If not so, then why? How we can generate felt need in them? To get answers for these questions many intervention programs, for example mass awareness campaigns for control and prevention of the disease and community involvement, have to be started. Role of NGOs should be acknowledged sufficiently and adequately supervised.

26. **Recording and reporting**: There are three types of forms-sputum smear examination, culture/ sensitivity, and transfer; two cards-identity and treatment; two registers- laboratory and TB register. Tuberculosis Unit (TU) has to submit quarterly report on new patients, sputum conversion, treatment outcome of TB patients registered 12-15 months back. Program management: the report has to be submitted in four copies - one for state Head Quarter, one for Central TB division, one for NTI and the fourth copy is retained for record. Besides this, data has to be analyzed at the district to get information on age, sex, and category regimen distribution in the population, which is highly specialized technical job and required experts. District Medical Officers and Collectors of the districts have little role to play in general and in supervision and monitoring of the program, which will create unconcern attitude among them and less support which is actually needed for the success of program.
27. **Recent advances** in research including the sequencing of the genome of M tuberculosis, have raised hopes that better vaccines may become available over the next few decades (Cole 1998, Pym 1999). There is clearly a need for a new vaccine with a high protective efficacy against smear-positive tuberculosis in adults. New drugs with shorter and simple regimens, and improved diagnostics would be a substantial contribution to the tuberculosis control. However, it requires funding in research.
28. **Sustainability** of program should be seriously considered in presence of high cost of treatment (US $ 60-70), decreasing political commitment, budget crunch (gap) for TB control, which is US$ 15 million for 2005 (WHO report 2005), untrained manpower, lack of private sector involvement, poor literacy of people, etc.
29. A disease like TB which has multiple factors for its causation can not be controlled by just one method, i.e., early diagnosis and treatment. We already have evidence that TB had declined in western world before the invent of antitubercular drugs due to improvement of environmental conditions and living standards (Fig 9.12). These issues are totally neglected in the program.
30. TB patients should be screened for other diseases like diabetes, hypertension, hypercholestrolimia, etc to use the opporunity for comprehensive health care at the same time management could be more effective. Similarly patient of diabetes should be screened for tuberculosis because chance of occurence of TB inceases manyfold.

Figure 9.12: Mortality caused by tuberculosis in England and Wales. Source: McKeown T. The modern rise of population, London: Edward Arnold, 1976.



References

Alpert PL, Munsiff SS, Gourevitch MN, Greenberg B, Klein RS. A prospective study of tuberculosis and human immunodeficiency virus infection: clinical manifestations and factors associated with survival. Clin Inf Dis. 1997; 24: 661-668.

Alwood K, Keruly J, Moore-Rice K, Stanton D, Chaulk CP, Chaisson RE. Effectiveness of supervised, intermittent therapy for tuberculosis in HIV-infected patients. AIDS 1994; 8:1103-8.

Bedi RS. RNTCP-Need for Review? Ind J Tuberculosis 1997, 44, 161-162.

Behr MA, et al. Comparative genomics of BCG vaccines by whole genome DNA microarray. Science 1999; 284:1520-3.

Brewer TF. Preventing TB with Bacillus-Calmette-Guerin vaccine: A meta-analysis of the Literature. Clinical Inf Diseases 2000; 31 (S3): S64-67.

Chakraborty AK. Expansion of the Tuberculosis program in India: The policy evolution towards decentralization and integration. The Center for Health Research and Development (CHRD), A unit of the Maharashtra Association of Anthropological Sciences, Pune India 2003.

Chauhan LS. Status Report on DOTS expansion and implementation during the 2nd Quarter 2004. JIMA 2004; 102: 627-28.

China Tuberculosis Control Collaboration. Results of Directly Observed Short Course Chemotherapy in 112,842 Chinese patients with Smear Positive Tuberculosis. Lancet 1996; 347:358-62.

Cole ST, et al. Deciphering the biological of mycobacterium tuberculosis from the complete genome sequence. Nature 1998; 393: 537-44.

Colelitz GA, et al. Efficacy of BCG vaccine in the prevention of tuberculosis. JAMA 1994, 271: 698-702.

Datta M, Radhamani MP, Selvaraj R et al. Critical Assessment of Smear-Positive Pulmonary Tuberculosis patients after chemotherapy under the District Tuberculosis Program (DTP). Tubercle and Lung Disease 1993; 74: 180-186.

Dhingra VK, et al. Adverse drug reaction observed during DOTS. Joint Annual Conference of ISMCD and IAE, November 19-21, 2004, New Delhi.

Enarson DA, Grosset J, Mwinga A, Hershfield ES, O'sBrien R, Cole S, Reichman L. The Challenge of tuberculosis: statements on global control and prevention. Lancet 1995, 346: 809-819.

Espinal MA, Laszlo A, Simonsen L, et al. Global Trends in resistance to Antitubercular drugs. New Engl J Medicine 2001; 344:1294-303.

Fine PEM. BCG vaccines and vaccination. In: Reichman LB, Hershfield ES, Editions. Tuberculosis-a comprehensive international approach. New York: Marcel Dekker 2000; pp. 503-22.

Gothi GD. Tuberculosis- An overview - Influence of HIV and MDR, the new diagnostic tools and their application in NTP. Ind J Tuberculosis 1997; 44: 107-119.

Govt of India. Annual status report. TB India 2013. Available from www.tbcindia.nic.in

Govt. of India-SIDA, WHO. Review Committee Report 1992.

Govt. of India. TB India 2001: RNTCP Status Report. Central TB Division, DGHS, Min of H & FW, New Delhi.

Govt. of India. National Framework for Joint TB/HIV Collaborative Activities. Central TB Division and National AIDS Control Organization Ministry of Health and Family Welfare Government of India New Delhi 2008.

Government of India. Revised National Tuberculosis Control Program: Revised Schemes for NGOs and Private Providers. Central TB Division, Directorate General of Health Services, Ministry of Health and Family Welfare, Nirman Bhavan, New Delhi, August 2008.

Gupta KB, Gupta R, Atreja A, Verma M, Vishvkarma S. Tuberculosis and nutrition: A Review Article. Lung India,26 (1) Jan- Mar 2009.

Hayward CMM, Herman JI, Griffin GE. Drug resistance tuberculosis: mechanisms and management. J Applied Med. 1996; June: 505-512.

Hong Kong Chest Service/British Medical Research Council. Adverse Reaction to Short-Course Regimens containing streptomycin, isoniazid, pyrazinamide, and rifampicin in Hong Kong. Tubercle 1976; 57: 82-95.

Hong Kong Chest Service/British Medical Research Council. Controlled Trial of 6 months and 9 months regimens of daily and intermittent streptomycin plus isoniazid plus pyrazinamide for pulmonary tuberculosis in Hong Kong. The result up to 30 months. Am Rev. Respir. Dis. 1977; 115: 727-735.

Hong Kong Chest Service/British Medical Research Council. Controlled trial of 2,4, and 6 months of pyrazinamide in 6 months, three-times weekly regimens for smear-positive pulmonary tuberculosis, including an assessment of a combined preparation of Isoniazid, rifampicin, and pyrazinamide: Result at 30 months. Am. Rev. Respir. Dis. 1991, 143: 700-706.

ICMR. First drug resistance investigation. Ind J Med Research 1968; 56: 1617-1630.

ICMR. Second drug resistance investigation. Ind J Med Research 1969; 57: 823-35.

ICMR. Multi-drug resistant and Extensively drug resistant TB in India: Consensus statement on the problem, prevention, management and control from the consultative meeting of national experts organized by the TB Research Centre. ICMR, Govt. of India, on 14-15 September 2007, at Chennai

Iseman MD. Treatment of Multidrug-resistance tuberculosis. The New Engl J of Medicine 1993; 329: 784-91.

Jain NK, Chopra KK, Prasad G. Initial and acquired isoniazid and rifampicin resistance to M. tuberculosis and its implication for treatment. Ind J Tuberculosis 1992; 39: 321-4.

Kandi S, Madhavi G. Emerging trends in the diagnosis of tuberculosis-RNTCP and beyond. Ind JIMA 2010; 108 (6): 366-370.

Kishore J. A Dictionary of Public Heath. New Delhi: Century Publications 2013.

Lonnroth K et al. Tuberculosis control 2010-2050: cure, care and social change. Lancet 2010 DOI: 10.1016/s0140-

Menon S, et al. Drug resistance profiles of mycobacterium tuberculosis to first line anti-tuberculous drugs: A five years study. Lung India 2012;29 (3): 227-231.

Morisky DE, Malotte CK, Choi P et al. A patient education program to improve adherence rates with antituberculosis drug regimens. Health Educ Q. 1990; 17: 253-67.

Murray CJL, Lopez, AD. Global mortality, disability, and the contribution of risk factors: Global Burden of Disease study. Lancet 1997; 349: 14-36-42.

Nagpaul DR, et al. Bulletin of the International Union Against Tuberculosis 1968; 54: 148.

Negi SS, Gupta S, Lal S. Drug resistance in TB in Delhi: A 2 Year Profile. J Comm Diseases 2003; 35(2): 74-81.

NTI. National Tuberculosis Institute - Annual Report of NTP 1994, NTI Newsletter, 1995.

Paramasivan R, et al. Short Course Chemotherapy: A Controlled Study of Indirect Defaulter Retrieval Method. Ind J Tuberculosis 1998; 40: 185-90.

Paramasivan CN. An overview of drug resistant tuberculosis in India. Indian Journal of Tuberculosis 1998; 45:73-81)

Pardeshi G, Deshmukh. Non-DOTS regimens under RNTCP: Reasons for initiation and treatment outcome. J Com Disease 2009; 41(1): 45-52.

Pathak P, Haider S, et al. Patient's awareness and some behavioral issues related to TB and DOTS. Ind J Public Health 2008; 52 (4): 230-231.

Pilote L, Tulsky JP, Zolopa AR, Hahn JA, Schecter GF, Moss AR. Tuberculosis prophylaxis in the homeless. A trial to improve adherence to referral. Arch Intern Med 1996; 156: 161-5.

Pym AS, et al. Post DOTS, postgenomics: the next century of tuberculosis control. Lancet 1999; 353: 1004-5.

Rao S. Sputum smear microscopy in DOTS: Are three samples necessary? An analysis and its implications in tuberculosis control. Lung India 2009; Vol 26 (1)Jan - Mar.

Rajeshwari R, Balasubramaniam R et al. Private pharmacies in tuberculosis control-a neglected link. International J Tub & Lung Disease 2002B; 6: 789-95.

Rodrigues et al. Ind J Medical Microbiology 2007; 25 (1): 32-36)

Sanmarti L, Megias JA, Gomez MN, Soler JC, Alcata EN, Puigbo MR, Majem LS. Evaluation of the efficacy of health education on the compliance with antituberculous chemoprophylaxis in school children. A randomized clinical trial. Tubercle Lung Dis 1993; 74: 28-31.

Sarita Shah N, et al. Worldwide emergence of extensively drug resistant tuberculosis. CDC EID 2007; 13:3 (www2a.cdc.gov/ncidod/ts).

Sethi S, et al. PGIMER researchers find prevalence of MDRTB in Chandigarh at 17% (Alltimes. Friday, May 10, 2013).

Singh MM, Dhingra VK. Essentials of Tuberculosis for Practitioners of modern medicine. The Tuberculosis of India 3 Red Cross Road, New Delhi 110001.

Squire SB, Wilkinson D. Strengthening "DOTs" through community care for tuberculosis-observation above isn't the key (Editorial). British Medical Journal 1997; 315: 1395-96.

Tomen K. Tuberculosis case finding and chemotherapy-Questions and Answers. WHO 1979:209.

TRC. Shortening short-course chemotherapy: a randomized control trial for treatment of smear positive pulmonary tuberculosis with regimen using ofloxacin in the intensive phase. Ind J Tuberculosis 2002; 49: 27-38.

TRC. Causal analysis and treatment protocols for tuberculosis. In. NCMH Background paper. Ministry of Health & Family Welfare, Govt. of India 2005.

Tuberculosis Chemotherapy Center, Madras. Controlled Comparison of Oral twice-weekly and Oral Daily Isoniazid plus PAS in newly diagnosed pulmonary tuberculosis. British Medical Journal 1973; 2: 7-10.

Volmink J, Matchaba P, Garner P. Directly Observed Therapy and Treatment Adherence. Lancet 2000; 355: 1345-50

Walley JD, Khan MA, Newell JN et al. Effectiveness of direct observation component of DOTS for tuberculosis: randomized controlled trial in Pakistan. Lancet 2001; 357: 664-669.

Wilson ME, et al. Geographic latitude and the efficacy of Bacillus Calmette-Guerin vaccine. Clinical infection Disease 1995; 20:982-91.

WHO. TB: A clinical manual for Southeast Asia. WHO: Geneva, 1997; pp: 135-136

WHO Report 2005: Global Tuberculosis Control-Surveillance, Planning, Financing. WHO Geneva 2005.

WHO. Antituberculosis drug resistance in the world: Report 3. (Document No. WHO/HTM/TB/2004:343). Geneva:2004.

WHO. Actions for Life Towards a world free of Tuberculosis. The Global Plan TO STOP TB 2006-2015. WHO 2006.

Zignol M, Hosseini MS, Wright A, et al. Global incidence of multi-drug resistant tuberculosis. J Infect Dis 2006; 194: 479-85.

Zodpey S. Application of Case-Control Design and Meta-Analysis in resolving BCG Controversy. Jabalpur: Banarsidas Bhanot 2006.

CHAPTER 10

NATIONAL AIDS CONTROL PROGRAM

INTRODUCTION

Human Immunodeficiency Virus (HIV) is a lentivirus that belongs to the retroviruses group may cause HIV infection/AIDS. Acquired Immunodeficiency Syndrome (AIDS) has emerged as one of the most serious public health problems in the country after reporting of the first case in 1986. The first case of HIV positive was reported from Pune and first AIDS case was reported from Chennai. Initially the cases were among commercial sex workers in Mumbai and Chennai and injectable drug users in Manipur. The disease is spread rapidly in the areas adjoining these epicenters and currently Tamil Nadu, Andhra Pradesh, Maharashtra, and Manipur together account two third of the total AIDS cases.

EPIDEMIOLOGY

Definition of AIDS Case

WHO and National AIDS Control Organization (NACO) have given the definition of AIDS on the basis of certain criteria which are given below:

Clinical AIDS in an adult

a. Positive test for HIV antibody detected by two separate tests using two different antigens and any one of the following criteria:

1. • Weight loss of >10% body weight or cachexia.
   • Chronic diarrhea of >1 month duration, chronic cough >1month duration
2. Disseminated, miliary or extra-pulmonary tuberculosis.
3. Neurological impairment that restricts daily activities.
4. Candidiasis of the esophagus diagnosable Dysphagia along with oral candidiasis.
5. Kaposi's sarcoma.

Clinical stage progression:

Stage I : HIV infection – asymptomatics/acute primary infection (sero conversion)

Stage II : Early (asymptomatic) disease (CD4 count >500/mm^3)

Stage III : Intermediate HIV infection (CD4 200-500/mm^3)

Stage IV : Late stage HIV disease (CD4 50-200/mm^3)

Stage V : Advanced HIV Disease (CD4 <50/mm^3)

Clinical case definition for AIDS in children

At least two major signs associated with at least two minor signs in the absence of known cases of immunosuppression.

Major Signs

a. Weight loss or abnormal slow growth,

b. 1. Failure to thrive;
   2. Recurrent/persistent diarrhea of over one month duration;

3. Recurrent bacterial infections, e.g., lower respiratory infection
4. Recurrent fever of over one month duration

c. 1. Candidiasis
2. Tuberculosis
3. Herpes zoster (HZ)

Minor signs

a. Generalized lymphadenopathy
b. Oropharyngeal candidiasis
c. Repeated common infections (otitis, pharyngitis, etc.)
d. Persistent cough for over a month
e. Generalized dermatitis
f. Confirmed maternal HIV infection

Risk of transmission

Transmission dynamics reveal how HIV-1 spread in the population which helps in designing control program. The basic reproductive rate R_0, is the average number of infectious contacts by one infected individual. An infectious contact is a person who would transmit the infection if his/her partner is noninfected. For an epidemic to occur, each infected individual must on an average make infectious contacts with more than one individual (R_0 must exceed 1).

$$R_0=\beta(C+D)$$

where beta (β) is probability of infection per contact, C is rate of partner change, and D is the infectiousness. This equation is affected by individual social and psychological factors (partner selection, sexual and social network), family dynamics (type of family, economic conditions, etc.), community factors (type of neighborhood, social capital, health services, etc.), and national and international factors (war, development and health policies).

The problem of injectable drug use through needles has emerged as a serious problem firstly in Manipur and other North-Eastern States and in metropolitan cities like Mumbai, Chennai, Kolkata and Delhi. The problem of HIV/AIDS has added a new dimension as sharing of injection equipment for narcotic drug use is one of the most efficient routes of HIV transmission and is considered to be much more risky than unprotected sexual contact. While most of Injecting Drug Users (IDUs) are male, their female partners are not known to be in the habit of injecting drug use. The later therefore suffer the risk of sexual transmission from HIV-infected IDUs without their knowledge. It has also been noticed that majority of the IDUs are youth in their most productive age group of 15-25 years. Government therefore considers it as a serious issue and is committed to adopt appropriate strategies for preventing the risk of transmission through injecting drug use. Beside sexual and IV drug using practices there are other important routes of transmission as given in Table 10.1.

Table 10.1: The risk of transmission of HIV through different modes

Route	Efficiency (%)
Sexual	0.01 to 1
Transfusion of blood/blood products	>90
Sharing needles/syringes	3-5
Percutaneous exposure	0.4
Mucocutaneous exposure	0.05
Mother to child transmission	25-30

Burden of HIV/AIDS

According to UNAIDS/WHO estimates, there are 36.9 million [34.3 million–41.4 million] people with HIV and 66% of them are in sub-Saharan Africa. More than 95% of all HIV-infected people are now living in the developing world. There are 2 million [1.9 million–2.2 million] new cases and 1.2 million [980 000–1.6 million] deaths. There are 4.3 lakh children born with HIV so 2.1 million children are with HIV infection under the age of 15 years (UNAIDS 2015).

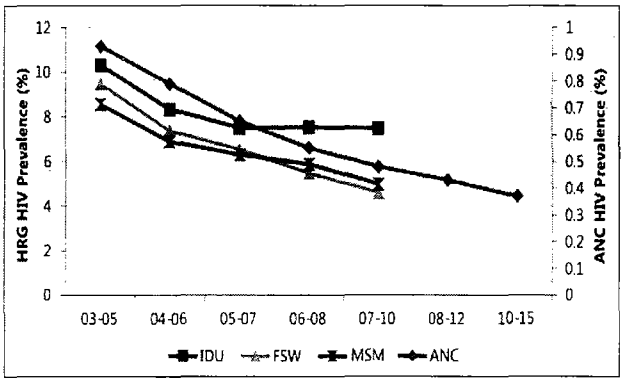
It is estimated that India had approximately 1.2 lakh new HIV infections in 2009, as against 2.7 lakh in 2000 (Fig. 10.1).

Highest prevalence states- Nagaland (1.29%), followed by Mizoram (0.81%), Manipur (0.60%), Gujarat (0.56%) and Chhattisgarh (0.41%).

Following characteristics of the AIDS epidemic in the country have been observed:

- The UN Population Division projects that India's adult HIV prevalence will peak to 1.9% in 2019.
- **Adult HIV Prevalence:** The estimated adult HIV prevalence (15-49 years) in India was 0.27 percent in 2011 The adult prevalence is 0.26 percent among women and 0.38 percent among men in 2008, and 0.25 percent among women and 0.36 percent among men in 2009 (Pandey A et al

Figure 10.1: Trends of HIV Prevalence in ANC and HRG



Source: HIV Sentinel surveillance 2015

2012). 41% of new cases come from states of UP, MP, Gujrat, Orissa, Bihar, WB.

- **People Living with HIV/AIDS (PLHA):** The total number of people living with HIV/AIDS (PLHA) in India is estimated at 20.9 lakh (19.3 – 30.4 lakh) in 2011(Table 10.1). Children under 15 yrs account for 7% (1.45 lakh) of all infections, while 86 percent are the in age group 15-49 years. Of all HIV infections, 39 percent (8.16 lakhs) are among women. The four high prevalence states of South India (Andhra Pradesh–5 lakhs, Maharashtra–4.2 lakhs, Karnataka–2.5 lakhs, Tamil Nadu–1.5 lakhs) account for 55 percent of all HIV infections in the country.

- **Routes of Transmission** of HIV, India, 2010-11 (till Jan. 2011): Unprotected sex (87.4% heterosexual and 1.3% homosexual) is the major route of HIV transmission, followed by transmission from Parent to Child (5.4%) and use of infected blood and blood products (1.0%). While Injecting Drug Use is the predominant route of transmission in north eastern states, it accounts for 1.6 percent of HIV infections (Table 10.2).

Figure 10.2: Route of transmission

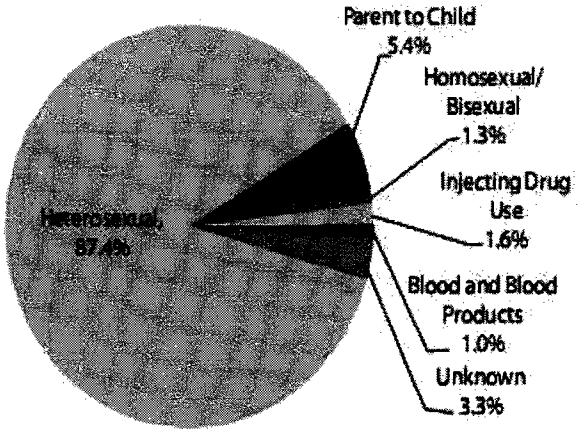


Figure 10.3: HIV Prevalence among ANC clients and other risk groups

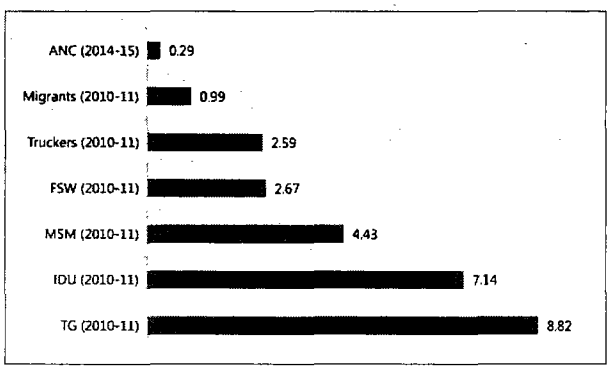


Table 10.2: AIDS Patients characteristics (Data of Cumulative cases).

	2001	*2006*	*2010*
Sex	*(%)*	*(%)*	*(%)**
Male	76	70.6	0.35
Female	24	29.4	0.25
Mode of transmission	*(%)*	*(%)*	*(%)*
Sexual	84.4	85.3	88.7
Perinatal	2.38	03.8	05.4
Blood & Blood Products	3.19	02.1	01.0
Injectable Drug users	3.13	02.3	01.6
Others	6.87	06.5	03.3
Age group	*(%)*	*(%)*	*(%)*
0-14 yrs	3.7	04.7	3.5
15-29 yrs	41.5	31.8	[83-
30-44 yrs	45.7	56.3	-]#
>45 yrs	09.1	06.7	13.5

(Source NACO 2001, NACO 2015)
** Prevalence of HIV in general population*
 # 83% in 15-44 years of age

The geographical nearness of Manipur to Burma and therefore to the Golden Triangle drug trail, has made it a major transit route for drug smuggling, with drugs easily available. However, the transmission route of HIV/AIDS in the state is no longer confined to injecting drug users. It has spread further to the female sexual

partners of IDUs and their children (InfoChange (2003). The prevalence of HIV/AIDS in ANC cases in Manipur was 1.12% in 2002 and among injectable drug users at three surveillance sites, the HIV prevalence was extremely high -39.06%. Similarly high prevalence of HIV among drug users is recorded in Mizoram (70%) (World Bank), Nagaland (10.28%) and Tamil Nadu (33.8%).

Attributable Factors of the HIV Spread

HIV/AIDS is not a disease that spreads randomly. It is transmitted as a consequence of a specific behavioral pattern and has strong socioeconomic implications. It not only costs huge sums of money in terms of controlling the opportunistic infections such as TB, pneumonia, diarrheal diseases and cryptococcal meningitis, but also seriously affects individuals in their prime productive years causing enormous economic loss to them, to their families and to the country.

Affected Population

The majority of the reported AIDS cases have occurred in the sexually active and economically productive 15 to 49 year age group. The predominant mode of HIV transmission is heterosexual contact, the second most common mode being injectable drug use.

Although HIV/AIDS is still largely concentrated in at-risk populations, including commercial sex workers, injecting drug users, and truck drivers, the surveillance data suggests that the epidemic is moving beyond these groups in some regions and into the general population through the bridging population (Lancaster 2003; Kaiser Network 2003). It is also moving from urban to rural districts (USAID 2003).

The epidemic continues to shift towards women and young people. It has been estimated that 38% of adults living with HIV/AIDS in India at the end of 2003 were women (UNAIDS 2004). In 2004, it was estimated that 22% of HIV cases in India were house wives with a single partner (Heffernan 2004). The increasing HIV prevalence among women can consequently be seen in the form of increased mother to child transmission of HIV and pediatric HIV cases.

Sex workers: Mumbai has the country's largest brothel based sex industry, with over 15,000 sex workers (Gomare et al. 2002) and major challenge for HIV prevention (Shankaran 2002). A study in Surat found that HIV prevalence among sex workers had increased from 17% in 1992 to 43% in 2000.

MSM: Male having sex with male includes normative males (panthis) who desire to penetrate as the only signifier, feminized males (kothis) who desire to be penetrated, male who have partners of both sex (duplis) along with hijras, who desire to be penetrated by other males and adolescent and other males who desire to experiment for fun. They are at a high risk of HIV and STIs. They are if known treated like social outcaste, the more they will try to conceal their feelings and perception, the net result is frustration and comorbidity with psychiatric illnesses (Deb S et al 2010).

Injecting Drug users: HIV infections among Injecting Drug Users (IDUs) first appeared in Manipur and in the City, the level of HIV infection was 61% in 1994 and increased to 85% in 1997. In 1998, it was found to be 80.7%. Injectable drug use is also a major problem in urban areas such as Mumbai, Kolkata, Delhi and Chennai (Reid & Costigan 2002). Recent data indicate that most IDUs had at some stage shared their needle and syringe. Majority of drug users are male, however, females are also involved and found more HIV positives as compared to non-drug addicts females (Panda et al 2002). There is increased number of widows of addicts, many of them are HIV positives. Recently drug users are increasing in Bihar and Chatisgarh

Migrants: According to the 1993, National Sample Survey in India, 24.7% of the population had migrated, either within India, to neighboring countries or overseas. Applying this percentage to the mid-2003 population (Population Reference Bureau 2003), about 264 million Indians are mobile. Though being mobile in itself is not a risk factor for HIV transmission (UNAIDS 2001). They often live in unhygienic conditions in urban slums. Long working hours, relative isolation from the family and geographical mobility may foster casual sexual relationships that make them highly vulnerable to STDs and HIV/AIDS. Migrant workers tend to have little access to HIV/STD information, voluntary counselling and testing and health services. Cultural

and language barriers worsen their lack of access to such services. Returning or visiting migrants, many of who do not know their status, may infect their wives or other sex partners in the home community.

Truck Drivers: India has one of the largest road networks in the world and an estimated 2 to 5 million long distance truck drivers and helpers are a part of this network. The extended periods of time that they spend away from their families place them in close proximity to "high-risk" sexual networks, and often results in their increased number of sexual contacts (Ekstrand et al 2003). During their journeys the drivers often stop at '*dhabas*', roadside hotels that usually provide food, rest, sex workers, alcohol and drugs. They pick up the women, use them and leave them at some other '*dhabas*', where they are used by other drivers and local youths. As a result, truck drivers are crucial in spreading STDs and HIV infection throughout the country (Kootikuppala 1999, Christensen 2002).

Literacy

Poor literacy is associated with high rate of infection probably because of low awareness levels about risk factors among potential high risk groups.

Gender Disparity

Women are more vulnerable than men and yet get a low priority in her rights of treatment and prevention. Increase number of HIV positivity among ANC mothers is an indication of gender disparity. Poor economic status of woman makes the situation even more worse, she is more discriminated and not treated if her HIV status is known. On the other hand, no woman has the status to demand condom use from their husbands even if she knows the HIV status of her husband (Human Rights News 2002).

Heavy Burden of STDs

High prevalence of Sexually Transmitted Infections and Reproductive Tract Infections among men and women are found in India. It is also found that STI/RTI increases the chances of HIV transmission.

HIV & TB

There is also a twin challenge of HIV/TB co-infection. Nearly 60% of the AIDS cases are reported to be suffering from the opportunistic TB infection. Treatment of TB among the HIV-infected persons is a new challenge to the National TB Control Program. Some of the antitubercular drugs recommended for TB treatment pose complications in cases of HIV-infected persons, e.g. *thiacetazone* can cause skin eruptions.

Stigma

The social stigma attached to sexually transmitted infections also hold good for HIV/AIDS, even in a much more serious manner. This, coupled with lack of awareness, results in reporting of full-blown AIDS cases in cities like Mumbai and Chennai. There have been cases of refusal of AIDS patients for management in hospitals and nursing homes both in Government and private sectors. This has compounded the misery of the AIDS patients. Moreover, isolation of AIDS cases in the wards creates a scare among the general patients while at some occasions discrimination at workplace also leads to loss of employment.

In India the social reactions for people with AIDS have been overwhelmingly negative. For example, in one study 36% of people felt it would be better if infected people killed themselves, the same percentage believed that infected people deserved their fate. Also, 34% said they would not associate with people with AIDS, and one fifth stated that AIDS was a punishment from God. Negative attitudes from health care staff have generated anxiety and fear among many people living with HIV and AIDS (UNAIDS (2001). As a result, many patients keep their status secret fearing the discrimination from their peers.

Reports of human rights violations of HIV positive patients, particularly children, are common in new dailies. HIV kids are not allowed to get into schools (Indian Express 2007; 15 June:1). Doctors were beaten by public for admitting HIV positive patient (Indian Express 2007 July 14).

Devdasi System

Devadasi women are a group of women, who historically, have been dedicated to the service of gods. These days, this has evolved into sanctioned prostitution- as a result many women from this part of the country are supplied to the sex trade in big cities such as Mumbai (Sivaram 2002).

Lack of Effective Treatment
The treatment options are still in the trial stage and too expensive. Drugs are made available in few selected centers in the country. Further these are also known for their side effects which affect the compliance.

No Vaccine
Although, there are many candidate vaccines under field trials, but still no effective vaccine is available.

Quacks
There were instances of quacks taking advantage of the situation and promising cure through so-called herbal treatment providing only false assurances.

Poor Blood Banks Services
Existence of a large number of unlicensed small and medium blood banks in the private sector has also compounded the problem.

Moral Value Systems
The twin problem of drug addiction and HIV transmission raises serious ethical and moral issues in the Needle Exchange Programs and condom distribution. The law of the land does no permit a person to take drugs or go to the prostitutes.

Other Risk Practices
Although transmission of HIV through use of needles, razors and other cutting instruments in thousands of beauty parlors and haircutting saloons is insignificant, lack of hygienic practices in majority of these establishments also poses a health risk to the unsuspecting general population who visit these places every day. Difficulty in identifying, reaching, and covering risk groups for interventions is huge.

Lack of Community Involvement
Poor involvement of NGOs may be due to Borrower's and recipients' non-familiarity with guidelines and project processing requirement. National and International funds are available but due to poor management skills and professional support they can not be fully utilized. Stigma associated with lack of family support is adversely affecting rehabilitative services. In Thailand, a hospice at a Buddhist temple is facing problem of overcrowding of HIV survivors because more and more people are getting treatment and live longer but their family members do not accept them so they remain in hospice (TOI 17th Dec 2006).

Poor Management
Lack of uniformity in the process of disbursement of funds in various states, vacant posts, frequent transfers, holding of dual charges, and changes in staffing patterns are again major hurdles in implementation of preventive program strategies.

Denial of HIV/AIDS problem
In spite of constituting a High Power Committee in 1986 and launching National AIDS Control Program in 1987, government initially denied that India suffered from epidemic of AIDS. Similarly, large segment of the civil society did not acknowledge HIV as a priority in the early 1990s and were critical of the Central Government and the World Bank for drawing attention towards HIV/AIDS. There has been an inadequate understanding of the serious implications of the disease among the legislators, political and social leaders, bureaucrats, media, leaders of trade and industry and even among medical and paramedical personnel engaged in provision of health care.

Global initiatives

- **The 3 by 5 Initiative** - launched by UNAIDS and WHO in 2003, with a global target to provide 3 million people living with HIV/AIDS in low- and middle-income countries with life-prolonging ART by the end of 2005.
- **UNAIDS Fast-track strategy** – Launched in 2014 with target- By 2020, 90% of all people living with HIV will know their HIV status, 90% of all people with diagnosed HIV infection will receive sustained ART, 90% of all people receiving ART will have viral suppression
- **Sustainable development Goals** – Target 3.3 – Aims to end the HIV epidemic by 2030

NATIONAL RESPONSE

History
Immediately after the report of a first case of HIV in 1986, the government constituted a High Power Committee in 1986 only. Subsequently, a National AIDS Control Program was launched in 1987. Since

then, the National AIDS Control Program has moved through three phases.

1986-1992, Denial of the various phases threat of HIV: This was a period that saw the beginning of a largely research-based program. Surveillance activities were launched in 55 cities in three states and the program activities were left to the states without strong central guidance.

1992-99, First acceleration of the program: Backed by World Bank funding and strong WHO GPA (Global Program on AIDS) support, this phase saw the creation of the National AIDS Control Organization (NACO). The program was started with five key objectives:

1. Strengthen the management capacity for HIV control.
2. Build surveillance and clinical management capacity.
3. Promote public awareness of HIV/AIDS and community support.
4. Safe and easy blood supply.
5. Control the spread of sexually transmitted diseases.

Professional blood donation was banned. Quality of condoms improved, STI clinics were strengthened and targeted interventions were started with the vulnerable communities. Achievements included higher levels of awareness creation, establishment of state level structures for program implementation and improvements in blood safety. The launch of successful individual projects such as the innovative intervention in Sonagachi amongst commercial sex workers and breakthroughs in reaching out to college youth through "University Talks AIDS (UTA)" were amongst its achievements.

1999-2006, NACP Phase II- Focus on targeted intervention: Building on the experience of the first phase, there was a twin drive to focus on coverage amongst high risk groups like sex workers, truck drivers and injectable drug users and to make the program multisectoral. It has resulted in a strongly decentralized program with the responsibility of implementation vested with the states. Strategies for Since a significant number of people are involved in sectors such as Railways, Heavy Industry, Steel, Coal, Power, Transport, and other organized and unorganized sectors besides Welfare, Insurance, ESI, Defence, Education and Entertainment sectors, it would be highly beneficial if these sectors are also involved in HIV/AIDS control.

State AIDS Control Societies (SACS)

State AIDS Cells were created for the effective implementation and management of National AIDS Control Program. However over a period of time it was realized that due to many cumbersome administrative and financial procedures, there was delay in release of financial outlay sanctioned by Government of India that caused problem in implementation of the program. For that the Ministry of Health and Family Welfare had advised to constitute a ***registered society*** under the chairmanship of the Secretary Health involving members representing various ministries like Social Welfare, Education, Industry, Transport, Finance, and NGOs to receive the fund and utilizes for the control activities.

The district level Societies under the 3-tier Panchayati Raj system and urban municipalities have also been formed. These play a very active role in implementing the programs and receive funds directly from the national programs. The district administration headed by the District Magistrate/Collector and the Chief Medical Officer of Health should be able to provide the necessary administrative and technical infrastructure for supporting the program.

National AIDS Prevention and Control Policy (NAPCP) 2002

The NAPCP 2002 was announced with the aim of bringing AIDS transmission at zero level by 2007. Following strategies had been adopted:

1. Prevention of further spread of the disease by making all people and specially the high-risk groups aware of its implications and provide them with the necessary tools for protecting themselves from getting infected.
   - Control of Sexually Transmitted Diseases (STDs) among sexually active and economically productive groups;
   - Promotion of condom use as a measure of prevention from HIV infection;

2. To provide an enabling socioeconomic environment so that individuals and families affected with HIV/AIDS can manage the problem; and
3. Improving services for the care of People Living With AIDS (PLWA) in times of sickness both in hospitals and at homes through community health care;

For this purpose the policy addresses the following components of the national AIDS control program for bringing in a paradigm shift at all levels:

A. Program Management
B. Advocacy & Social Mobilization
C. Surveillance, Monitoring & Research
E. Target Intervention
D. Sexually Transmission Disease Control Program
E. Condom Promotion Program
F. Policy for Blood Safety

For the details refer the chapter on National AIDS Prevention and Control Policy (NAPCP) 2002.

National Health Policy 2002

National Health Policy 2002 set an aim for AIDS control so as to achieve zero level growth of new HIV/AIDS by 2007.

XIIth Five Year Plan (2012-17)

The Cabinet has approved budgetary support of Rs 8,632.77 crore for the National AIDS Control Program (NACP) Phase-IV (Govt of India 2013).

Objectives

1. (a) 80% reduction in new infections in high prevalence states; (b) 60% in low prevalence states.
2. Comprehensive Care, Support and Treatment to all persons living with HIV/AIDS

Strategies

1. Intensifying and consolidating quality prevention services to HRGs and vulnerable populations
2. Increasing access and promoting innovative and sustainable mechanisms for comprehensive Care, Support and Treatment
3. Expanding IEC services for (a) general population and (b) High Risk groups with a focus on behavior change and demand generation;
4. Strengthening institutional capacities and process of integration;
5. Enhancing access, coverage and quality of services by leveraging partnerships;
6. Strengthening program initiatives through innovations

Link Worker Scheme (LWS)

Under NACP-III has specifically been designed to address populations with high-risk behaviours (including the 'High Risk Groups' and 'Bridge Populations') as there are significant numbers in rural areas that need to be reached. In addition, the Scheme also cover young people.

Objectives

The specific objective of the scheme includes:

1. Reach out to HRGs and vulnerable men and women in rural areas with information, knowledge, skills on STI/HIV prevention and risk reduction.
2. Increasing the availability and use of condoms among HRGs and other vulnerable men and women.
3. Establishing referral and follow up linkages for various services including treatment for STIs, testing and treatment for TB, ICTC/PPTCT services, HIV care and support services including ART.
4. Creating an enabling environment for PLHA and their families, reducing stigma and discrimination against them through interactions with existing community structures/ groups, e.g. Village Health Committees (VHC), Self Help Groups (SHG) and Panchayati Raj Institutes (PRI).

The services are established at three levels:

Level 1: Village Panchayat: The Link Worker work closely with the existing health workers such as the Auxiliary Nurse Midwives, ASHA and Anganwadi workers. They also work with the Health and Sanitation Committee of the Village local body and local institutions, groups, youth clubs, schools, etc.

Level 2: District Level: At the District level, the Project work very closely with the District AIDS Prevention and Control Units (DAPCU) and the District Programme Management Unit of the NRHM. These are responsible for monitoring of various HIV/AIDS programmes and ensure integration both programmatically and institutionally with the district structures.

Level 3: The LWS at the district and village level works with different departments that have activities/ outreach to communities by mainstreaming HIV within their Programmes.

Implementation Strategy at District Level
In every identified district, 100 villages with vulnerabilities are chosen as core villages and another 500 proximal villages are covered (600 villages per district). For every five core villages (cluster) there are two link workers (1 male, 1 female). Link workers will be monitored by the Supervisor. Volunteers will be identified by the link workers to support them in various activities in the village for HIV prevention. While selecting the Volunteers representation is ensured from different cultural, political, social and religious groups (such as Local elected leaders, SHG members, Youth leaders, Representatives from women groups, farmers, school or out of school students). The population reached is at least 5000 people in each of 100 core villages and 1,000 in each of 500 proximal villages; totally reaching 10 lakh people per district. The scheme is implemented by through lead NGOs for each state for providing technical and administrative support to selected districts (for 4 or more). The lead NGOs in turn further sub contract district NGOs for implementation of the scheme at the village level.

National AIDS Control Program IV

Target Intervention for Migrants

Migration Definition: The Census of India defines migrant as a person who has moved from one politically defined area to another similar area. For the purpose of HIV programming in the country the revised migrant operational guideline defines migrants as-

- People (Both male and female) who move from their place of origin in rural areas (source) to a town or city (destination) for work purposes – irrespective of district/state/country
- Return to their place of origin at least once in 6-12 months while in work at destination areas
- Move frequently between districts for work purposes
- Move directly between the places (or) via the transit locations
- Move either alone or with their partners
- Those returned to places of origin (at source areas) either temporarily or permanently upon completion of work in destination areas
- Female spouses of returned and active migrants (at source areas) are at risk of HIV.

Currently there are three models of implementation reaching out to nearly 4 million migrants in the country:

- Targeted Intervention, led by NACO and SACS
- Non-TI migrant HIV program led by NGOs – like PSI, Avert Society, CARE
- Work Place Intervention, addressing unorganized sectors like Punj Lloyd. L&T, BEST, Hindalco etc.

Gaps Identified in NACP III

- Capacity of SACS, TSU and STRC need to be increased for better implementation of migrant interventions at source, transit and destinations.
- Linkage between source, transit and destinations across high migration and high HIV prevalence States need to be strengthened.
- Mainstreaming of HIV and Health interventions is required at all levels with active involvement of NRHM and Urban Health Mission.
- Currently the evidence related to HIV prevalence, ART uptake is missing among migrants.
- Structural interventions are important from the point of inclusiveness and sustainability. National migrant strategy need to look into the same.
- Flexibility in designing and implementing interventions is missing, the decisions are guidelines oriented.
- Scaling of up interventions requires careful understanding of risk profile and thus requires flexibility in human resources for different settings

Strategic Approaches of Migrant Interventions for NACP IV

Goal: To reduce HIV-infection ratio of migrants to non-migrants from 4:1 in 2010 to 1:1 in 2017.

Objectives:

- Increase coverage of high risk migrants (both Male and Female) from 30% in 2011 to 90% by 2015
- Increase consistent condom use among migrants from 25% to over 80% by 2015
- Reduce curable STI incidence among migrants and their sexual partners

- Increase HIV testing from 6 % in 2011 to 50% by 2015; and ensure 95% of HIV-positive individuals receive treatment and care
- Promote integration of HIV and SRH services, convergence with departments at both source and destination areas
- Enhance Advocacy with work place; corporate institutions, industrial associations, labour unions and Trust/ Foundations to partner in HIV prevention, care, support and treatment
- Ensure lobbying with identified government departments to develop strong linkages for mainstreaming the program at source, transit and destinations

Interventions priority (ongoing and new)

Type of interventions ***Priority***

Source

- Strengthen response in Link Worker Scheme districts
- Scale up in non-LWS districts
- Strengthen integrated response

Transit

- Strengthen integrated response through ministry of transport and railways
- Scale up interventions in destination states
- Destination Scale up intervention among informal workers in dispersed settings, female migrants
- Strengthen quality systems in STI and Outreach activities
- Strengthen communication activities for better Outreach
- Provision of condoms at clinics and counselling sessions
- Strengthen services for ICTC, TB in migrant settings

New Interventions

- Strengthen structural interventions
- Strengthen coordination with source states
- Prioritise on risk profiling, mapping
- Develop capacity on areas of program management, communication.

Targeted Intervention among Female Sex Workers

Average HIV prevalence among FSWs in India is ~5%, which is much higher than in the general population (<0.5%).

Achievement in NACP-III

Coverage has increased from 22.32% to 78%.

Gaps identified:

- TIs have been configured for prevention, provision to access care support and treatment is to be further strengthened for FSW interventions.
- The package for a TI is the same across the country, irrespective of the HIV and STI incidence/prevalence in the local context. Further, within a TI, differing individuals have different risk profiles, and programs should focus on those with highest risk.
- There are a few critical cities and districts, where despite interventions running for over a decade, HIV prevalence remains high. It is not known if HIV prevalence is high because positive women are on ART, or whether HIV incidence remains high. These TIs need close monitoring.
- Guidelines for positive prevention need to be drawn out.
- TIs are designed for units of 400-1500, and hence not for scale, considering that over one million sex workers have to receive services.
- Quality is variable: long standing programs in South India have reached certain standards of quality (though they continue to face challenges in some areas) whereas the programs in the north have been recently started, and hence require focused support on improving quality.
- While the aim was to strengthen and empower the community, CBOs failed to achieve the level envisaged at the beginning of NACP-III.

Strategic approaches for NACP IV

For prevention, treatment, care and support - FSW

Vision

Empower Female Sex Worker communities who respond to their needs and challenges through a comprehensive programme which builds community institutions and achieves prevention of STI and HIV leading to an improved sexual health

Key Program Targets

- Saturation of coverage against the national estimation
- All sex workers should receive non stigmatized, quality services for Prevention, Care, Support and Treatment that are acceptable to them (100% coverage with the above stated parameters)
- Reduction of violence in sex work setting by 80% from NACP III baseline.
- Community mobilization leading to development of sex worker collectives by end of NACP IV.
- Increase of condom usage to with regular clients to 80% from the base line for NACP III.
- Reduction of HIV prevalence from present 5% to 1% by end of NACP IV.
- 70% of sex workers will be undergoing regular medical check up
- Reaching out of 70% of hard to reach sex workers
- 60% exclusive FSW TIs will be led by community

Specific Intervention Priorities

1. Increased coverage in the north
2. Improving quality of intervention across all TI
3. Active participation and sharing of responsibility by community in all levels of decision making in TI including governance and representation
4. Building ownership, leadership and accountability of SACS in program development and implementation based on the State s perspectives and needs
5. Strategy to reach out hard to reach, young and trafficked women
6. Addressing trafficking and violence through self-regulatory board with necessary advocacy with WCD and other Govt of India Departments
7. Convergence of prevention, care, support and treatment with linkages and capacity development of TI
8. Development of state and district level community resources for the capacity building of TI staff.

Targeted Intervention among Men who have Sex with Men (MSM)

Among MSM, HIV prevalence is estimated at 7.3%, more than twenty times the general population rate (NACO, 2010). Prevalence of sexually transmitted infections too is reported high among MSM (example: syphilis - 5.8%3 to 14%4).

NACP IV

Goal

Towards zero new infections among MSM by the end of 2017; and universal access to HIV prevention, care, support and treatment services for MSM

Guiding Principles

- Universal access – inclusion of ***all*** high-risk MSM regardless of sexual identity, marital status, age or presumed/stated sexual practices (receptive or penetrative or both).
- Rights-based approaches in health care to ensure that NACP-IV provides all comprehensive and necessary HIV-related services for MSM and continue with its national policy of voluntary HIV testing and clinical screening.
- Elimination of stigma and discrimination against sexual minorities in various settings (healthcare settings, workplace, family, and society)
- Community systems strengthening - investing in the formation and strengthening of MSM community groups and networks to promote community ownership of the HIV programme.
- Address multiple vulnerabilities such as sex work, marital status, multiple stigmas and lower socioeconomic status.
- Emphasis on both the scale of services as well as on the quality of messages and services to maximize effectiveness and ensure that interventions and services are to large extent evidence-based.
- Ensure that MSM TIs not just focus on providing services to only those MSM accessing TI services, but also focus on prevention of HIV/ STIs to their steady partners – both men and women partners.
- Providing a comprehensive service package with a continuum of prevention, care, support and treatment services
- Flexibility to allow for adapting the TI design and implementation to suit the local context (urban/ rural, concentrated vs. dispersed MSM communities, etc.)
- Transitions of certain services (such as STI clinical services) to NRHM/NUHM after

ensuring proper sensitization of the government healthcare providers about the issues of sexual minorities and improving their competency to provide optimal clinical and counselling services.

STRATEGIC OBJECTIVES

1. To reach diverse subgroups of MSM through complementary outreach strategies to contact all at-risk MSM and provide behaviour-change communication (to promote safer sex and access to services)

The traditional outreach model of MSM coming to hot-spots or cruising sites will be expanded. The changes include: 1. employing outreach workers who are from different subgroups or typologies of MSM; 2. moving to sub-group-specific venues (e.g., bars for gay men, massage clubs that cater to same-sex attracted men); and 3. Outreach in events for communities (e.g., Pride March) or where events in which high number of MSM come together.

2. To provide a comprehensive package of prevention, care, support and treatment services to meet the needs of various subgroups of MSM and to ensure continuum of care

Essential package of services

1. Outreach and BCC
2. Condoms and Lubricants
3. Drop in Center
4. STI screening (Syphilis/other STIs, HBV)
5. Voluntary HIV testing and Counselling and risk reduction counselling
6. Crisis/Violence prevention and mitigation (Crisis response team)
7. Positive living and positive prevention

Additional package of services (Usually referral services)

1. Counseling related to one's sexuality and mental health issues /marital issues
2. Anal cancer screening for HIV positive MSM
3. Social Protection/entitlements
4. Alcohol dependency treatment and drug dependent treatment programs
5. Treatment of Hepatitis B infections
6. Screening for hepatitis C, if history of injecting drug use.

3. To create and sustain enabling environment that promote human rights and access to services for MSM

A supportive or enabling environment, that includes policies and legislation that address stigma, discrimination and violence, and psychosocial vulnerabilities, is critical to achieving universal access to HIV prevention, treatment, care and support. Activities to promote enabling environment thus will not only be limited to advocacy with the immediate stakeholders around the TI implementing sites but changing the negative attitude of the general public and healthcare providers towards same-sex attracted people.

4. To mobilise and strengthen MSM communities to effectively contribute to national responses to HIV epidemic

Community strengthening strategies include:

1. Community mobilization at the TI level (established CBO/NGO)
2. Support for formation, and strengthening of formal and informal community groups
3. Support for strengthening of existing national and state level networks of sexual minorities, and formation of new state level networks of sexual minorities
4. Linking and docking these networks with other government agencies to facilitate their mainstreaming into national goals of progressive, rational and scientific thinking

Estimation of high risk MSM to be covered in NACP-IV

The estimation of MSM (accessing cruising sites) to be covered in NACP-IV is based on a revised estimation method used in NACP-III. The estimate comes around 4.12 lakh.

Therefore, the number of high risk MSM who attend cruising sites who need to be covered in NACP-IV is 3.5 Million.

Targeted Intervention among Transgender and Hijra

Hijra is an "Individuals who voluntarily seek initiation into the Hijra community, whose ethnic profession is badhai but due to the prevailing socio economic cultural conditions, a significant proportion of them are into

begging and sex work for survival. These individuals live in accordance to the community norms, customs and rituals which may vary from region to region". *Transgender* is a gender identity. Transgender persons usually live or prefer to live in the gender role different to the one in which they are assigned at birth, this has got no relation with anyone sexual preferences. It is an umbrella term which includes transsexuals, cross dressers, intersexed persons, gender variant persons and many more. A term that includes people who have not undergone any surgery or physiological changes

HIV prevalence among MSM/Transgender populations was 5.7% as against the overall adult prevalence of 0.36%. Until recently, transgender communities were not distinguished from MSM in HIV sentinel serosurveillance. As a result, limited data is available on the prevalence of HIV and STIs among transgender communities. In 2002-03 a study was conducted in Mumbai, which indicated HIV prevalence among transgender (Hijra) sex worker were 56% (n = 163). In 2005, the prevalence rate among the same population went down to about 40%. In 2003, in Chennai city a similar study was conducted among 1200 Transgender population which revealed 45% prevalence rate.

A study conducted in Mumbai reported very high HIV prevalence of 68% and high syphilis prevalence of 57% (Setia et al 2006). Similarly, a study conducted among male sex workers in Mumbai that included Hijras as a major sub-group documented a very high HIV prevalence of 41% (Shinde S et al 2009). In Southern India, a study documented a high HIV prevalence (18.1%) and Syphilis prevalence (13.6%) among Hijras (Brahman GNV et al 2008). A study conducted in Chennai documented high HIV and STI prevalence among Aravanis: 17.5% diagnosed positive for HIV and 72% had at least one STI (48% tested seropositive for HSV-1; 29% for HSV-2; and 7.8% for HBV) (Saravanamurthy et al 2008).

Objectives

- Improve the human rights situation for transgender – hijras the cornerstone to an effective response to HIV
- Strengthen and promote the evidence base on hijras and transgender people and HIV
- Strengthen capacity and promote partnerships to ensure broader and better responses to hijras and transgender people and HIV

Services

Minimum/ basic / essential service package for TG - Hijras TI should include: Condoms and Lubes

- Free distribution of condoms and lubricants
- Anal sex (with clients-customers, with partners, with regular partners) Condom + Lube
- Oral sex (with clients-customers, with partners, with regular partners) condom
- All lubes(K Y Jelly) under social marketing-education to the TG/Hizra by other agency

Sexual health services that include:

- HIV counseling, testing and treatment
- STI screening and treatment
- Screening and treatment for genital and ano-rectal problems
- Linkages to existing mainstream health programs
- Hormonal management and monitoring for TG – hijras.

HIV

- Services for HIV-positive TG - Hijras: community based care and support
- Treatment for HIV, including the treatment of opportunistic infections (OIs)
- Provision of antiretroviral treatment (ART) and monitoring of CD4 counts and HIV viral load together with adherence
- Prevention services such as: Care, counseling and testing for sero-discordant couples
- Psychosexual counseling , Psychosocial counseling, including substance use issues
- Positive prevention

Enabling environment

- Violence and crisis management

Targeted media campaigns

- IEC material for use of lubricants

Targeted media campaigns

- IEC material for use of lubricants

Targeted Interventions for Truckers

Strategic Approaches of Migrant Interventions for NACP IV

Goal: To reduce HIV-infection 2% to less than 1% among truckers by 2017.

Objectives

- Increase coverage of LDTs from 50% to 85% among long distance truckers
- Operationalise National Network of Trucker TIs
- Ensure universal access to services through use of technology in line with NACP
- Strengthen quality and information sharing among national and state level management structures
- Scale up of WPI models, PPP models for long distance truckers

Table 10.3: Coverage of TIs

Typology	Mapping estimates	Current coverage (in Lakh)	TI coverage in TIs
FSW	8.68	7.18	82.7
MSM	3.13	2.59	82.7
Transgender	0.7	0.13	18.57
IDUs	1.77	1.32	74.6

SEXUALLY TRANSMITTED DISEASES CONTROL PROGRAM

The growing evidence available from all over the world undoubtedly indicates that the incidence of HIV infection is 8-10 time higher in conditions of presence of sexually transmitted diseases (STD). India has a high incidence of STD in urban as well as rural areas. Within a short period, in Mumbai alone HIV infection has reached 50 per cent among sex workers and 36 per cent among STD patients. Evidence also suggests that concomitant infection with other STDs, particularly those characterized by genital ulcers, increase the chance of HIV infection. Therefore, a person already having STD has a greater risk of acquiring HIV from sexual intercourse if he/she comes in contact with an infected partner.

STD as a cofactor for HIV transmission

a) Increasing evidence suggest that STD significantly enhance the acquisition and transmission of HIV.
b) The predominant mode of transmission of both HIV infection and STD is through sexual route, other routes of transmission are both blood and blood products, donated organs and tissues, and infected women to their newborn.
c) Many of the measures for preventing the sexual transmission of HIV are the same as for prevention of STD.
d) STD clinical services are important access point for persons at high risk for both HIV and STD, not only for diagnosis and treatment, but also for health education counseling and prevention.
e) Trends in STD incidence and prevalence, sexual behavior are easier to monitor than trends in HIV sero-prevalence and thus valuable for determining the impact of HIV/AIDS control Program.
f) *STD and Gender Perspective:* Due to ignorance, illiteracy, and nature of disease, which do not cause obvious symptoms many women prefer to stay home. When they go to the STD clinics, they feel stigmatized and often feel uncomfortable while being examined by male doctors and the necessary treatment may not be given.

Policy on Control of HIV/STD

The Ministry of Health and Family Welfare has adopted a policy of integrating HIV/AIDS and STD Control within the existing health care systems, both in the public and private sector. Special emphasis is being placed on the integration of comprehensive STD management at the primary health care level to provide non- stigmatized services with greater accessibility and acceptability to the patients while maintaining confidentiality and privacy of the patients. The policy strategy also emphasizes on the cooperation and collaboration with the private sector as well as non-governmental at organization for the control of STD. The STD policy document has been widely circulated; a number of manuals and guidelines have been prepared and also distributed in all states and UTs.

PROGRAM

The importance of treatment and control of STD in relation to HIV infection was recognized by NACO. After taking over the STD control Program in 1992, which was running since 1946, NACO made it an integral component of AIDS control policy. This Program earlier had only a limited number of specialized facilities for diagnosis and treatment. A very small proportion (only 5-10%) of people suffering from the disease were attending public STD facilities. The majority chose to seek clinical assistance from various other formal as well as informal sources, some times even resorting to self- medication. In the rural

areas, STD treatment facilities generally were not available.

The NACP-III is continued to provide STI services based on the principles of syndromic management and adequate referral systems to improve etiological management. STI/RTI management of RCH-II will be integrated with NACP-III. Mass mobilization campaigns for demand generation and service provision through "Family Health Awareness Campaigns" will be conducted annually. Syndromic management guidelines will be suitably modified based on STI surveillance and other related information. Indexing patient centered partner notification and treatment will be developed.

Objectives

- Reduce STD cases and there by control HIV transmission by minimizing the risk factor;
- Prevent the short term as well as long term morbidity and mortality due to STD.

Strategies

The broad strategies for controlling STD, as outlined in the strategic plan for the prevention and control of AIDS in India are the following:

Strategy 1: Develop adequate and effective program management

- Strengthening existing STD clinics in the country by providing drugs, consumables and laboratory support for diagnosis and treatment.
- Appointment of STD Program Officers in State AIDS Control Societies and identification of district nodal officers in each district to supervise the working of STD clinics.

Strategy 2: Promote IEC activities for the prevention of transmission of STD and HIV infection.

- Within the parameters of National AIDS Control Program, IEC activities have been designed for the prevention of STD and HIV infection including raising of awareness and promotion of appropriate health care seeking behavior of the people.
- Awareness generation activities are being initiated to educate the people for responsible sexual behavior, safer sex and condom use.

Strategy 3: Make adequate arrangement for comprehensive case management including diagnosis, treatment, individual counseling, partner notification, and screening of other diseases.

- Two sets of guidelines have been published and distributed for use in all first level Health care facilities and for referral centers where STD specialists are working.
- Training has already been imparted to medical and paramedical workers and Supervisors by the State AIDS Control Societies.
- Since laboratory facilities have been extremely limited in most primary health care setting, ***syndromic approach*** has been favored in the management of STD cases because of its cost effectiveness.
- In case of improving secondary and tertiary facilities, the existing STD clinics have been further strengthened in different district and taluk hospitals in the country and medical colleges.
- The five regional centers with attached regional STD referral laboratories have already been upgraded to provide necessary training for medical and paramedical staff; conducting research and laboratory tests and to ensure quality control of VDRL results.

Strategy 4: Increasing access to health care for STD by strengthening existing facilities and structures and creating new facilities wherever necessary.

- Strengthening existing STD Clinics.
- Increasing the demand through IEC & NGOs.
- New facilities at First Referral Units in collaboration with Department of Family Welfare.

Strategy 5: Creating facilities for diagnosis and treatment of asymptomatic infections.

- Provision of the trained lady medical officer in diagnosis and treatment of asymptomatic reproductive tract infections, including sexually transmitted diseases in MCH clinics.
- Sensitization of community about the problems related to RTI/STD through Family Health Awareness Campaign for early detection and referral to primary health centers for treatment.

STI/RTI Service Delivery: NACO has branded the STI/RTI services as "Suraksha Clinic" and developed a communication strategy for generating demand for these services.

Collaboration with NRHM: The physical targets of treating STI/RTI are distributed between NACO supported designated clinics and NRHM supported sub district health facilities. Convergence has been strengthened through constitution of a joint working group at national level. Colour coded drug kits have now been made available at all CHC and PHC.

Syndromic Approach

(Simplified STD treatment)

Most of the STD patients consult a doctor or health worker with complaints related to one of the following syndromes:

1. Urethral discharge
2. Vaginal discharge
3. Genital ulcer
4. Inguinal swelling, and
5. Lower abdominal pain

There may be different etiological agents causing these syndromes and diagnosing each one of the pathogen by laboratory investigation is very difficult and costly, and most of the places facilities are not available. Treatment of such problems by simplest method (Syndromic approach) with appropriate referral is quite feasible and has been accepted in the program.

The following seven pre-packed STI/RTI kits are provided under NACP III for syndromic management of STIs/RTIs and these are procured by NACO/ SACS (Table 10.4). These kits are developed based on the National Guidelines on Prevention, Management and Control of Reproductive Tract Infections including Sexually Transmitted Infections, Ministry of Health and Family Welfare, August 2007.

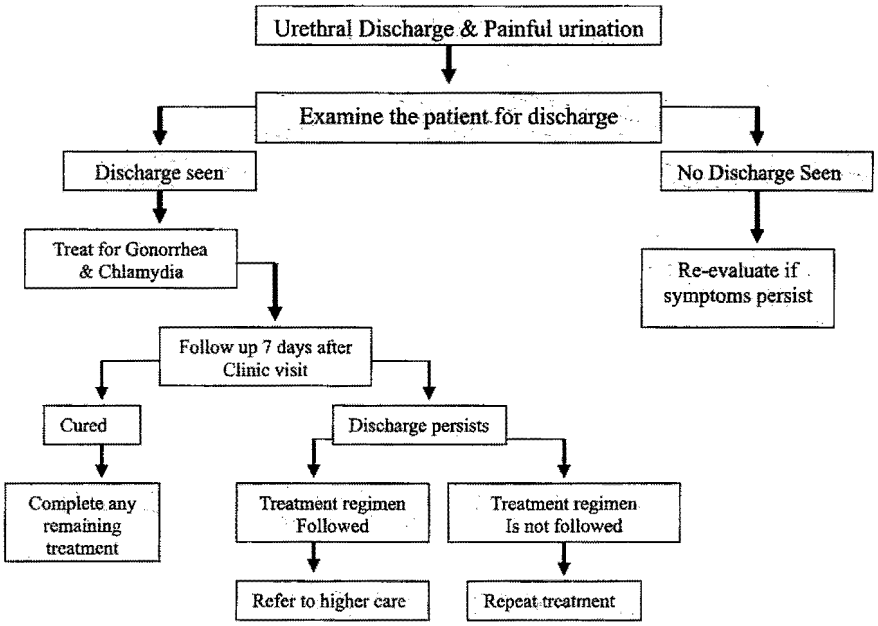
Urethral Discharge: Urethral discharge is usually due to gonococcal or non-gonococcal urethritis and should be treated with Norfloxacin 800mg in a single dose orally and doxycycline 100mg orally twice daily for 10 days. In case treatment fails, retreat with Spectinomycin 2g intramuscularly stat. If symptoms persist, compliance should be checked and partner should also be treated with the patient. If suspicion is high for gonorrhea then Ceftrixine 400mg in a single dose orally or ceftriaxone 250mg in a single dose (IM) or cirpofloxacin 500mg in a single dose orally, or Kanamycin 2 gm in a single dose (IM) may be given (Figure 10.4).

Vaginal Discharge: It could be due to gonococcal or non-gonococcal cervicitis or vaginitis (may be due to trichomoniasis, candidiasis or bacterial vaginoses). Speculum examination should establish the diagnosis. Cervicitis should be treated with Norfloxacin 800mg/ Ciprofloxacin 500mg in a single dose and doxycycline 100mg orally twice daily for 10 days. In pregnancy, Azithromycin 1 gm single oral dose or Erythromycin

Table 10.4: Pre-packed STI/RTI kits for syndromic manaagement

Kit No.	Syndrome	Colour	Contents
Kit 1	UD, CD, ARD, PSS, PT	Grey	Tab. Azithromycin 1 g (1) and Tab. Cefixime 400 mg (1)
Kit 2	Vaginal discharge (VD)	Green	Tab. Secnidazole 2 g (1) and Tab. Fluconazole 150 mg (1)
Kit 3	GUD	White	Inj. Benzathine penicillin 2.4 MU (1) and Tab. Azithromycin 1 g (1) and Disposable syringe 10 ml with 21 gauge needle (1) and Sterile water 10 ml (1)
Kit 4	GUD	Blue	Tab. Doxycycline 100 mg (30) and Tab. Azithromycin 1 g (1)
Kit 5	GUD	Red	Tab. Acyclovir 400 mg (21)
Kit 6	LAP	Yellow	Tab. Cefixime 400 mg (1) and Tab.Metronidazole 400 mg (28) and Cap. Doxycycline 100 mg (28)
Kit 7	IB	Black	Tab. Doxycycline 100 mg (42) and Tab. Azithromycin 1 g (1)

Figure 10.4: Algorithm of Syndromic Treatment of Urethral discharge



500mg orally four times a day for 7 days should be given instead of doxycycline. Vaginitis should be treated with Metronidazole 400mg three times a day for 7 days (except in first trimester) and Miconazole 100mg /clotrimazole 200mg intravaginally once daily for 3 days or clotrimazole 500 mg intravaginal once or fluconazole 150mg once. In first trimester of pregnancy no metronidazole is given.

Genital ulcer: It could be due to syphilis, chancroid, lymphogranuloma venerum, granuloma inguinale or herpes infections. Benzathene benzyl penicillin 2.4 Mega Units intramuscularly in a single dose and Doxycycline 100 mg orally twice daily for 15 days are effective. In case of Chancroid, ciprofloxacin or ceftriaxone can be considered as an alternative treatment. In pregnant females, Co-trimoxazole single strength 2 tablets twice daily for 15 days or Erythromycin 500mg orally 4 times a day for 15 days. In case of herpes topical antibiotic ointments with pain relieving treatment may be prescribed. Acyclovir 200mg orally 5 times daily for 7 days may be instituted in herpes.

Inguinal swelling (Bubo): Swelling is usually due to lymphogranuloma venerum (LGV) and treated with Doxycycline 100 mg orally twice or erythromycin 500mg orally 4 times a day for 14 days.

Lower abdominal pain/ Pelvic Inflammatory Disease (PID): Symptoms suggestive of PID include abdominal pain, dyspareunia, vaginal discharge, menometrorrhagia, dysuria, fever and sometimes nausea and vomiting. Patient should be treated with Kanamycin 2 gm intramuscular in a single dose or Spectinomycin 2gm intramuscular in a single dose and Doxycycline 100mg orally twice for 2 weeks and Metronidazole 400mg orally twice daily for 10 days. All patients treated on an outpatient's basis should be followed up after 72 hours, and admitted if not improved. In case of gonorrhea, a single dose of Ceftrixine 400 mg, or ceftriaxone 250 mg, or ciprofloxacin 500 mg may be given.

LABORATORY SERVICES

NACO launched "National External Quality Assessment Scheme" (NEQAS) in year 2000 to assure standard quality of the HIV tests being performed in the programme.

The objectives of NEQAS are:

- Monitoring laboratory performance and evaluate quality control measures
- Establish intra laboratory comparability and ensure creditability of laboratory
- Promoting high standards of good laboratory practices

- Encouraging use of standard reagents/ methodology and trained personnel
- Stimulating performance improvement
- Influencing reliability of future testing
- Identifying common error
- Facilitate information exchange
- Supporting accreditation
- Educating through exercises, reports and meetings. Assess the performance of a various laboratories engaged in testing of HIV which will be used for finalisation of the India specific protocols.

NEQAS categorised the laboratories into four tiers, as follows:

1) Apex laboratory (First Tier) - National AIDS Research Institute, Pune
2) Thirteen National Reference Laboratories (NRLs) located in all parts of India are to undertake the EQAS in their respective geographical areas including apex (second tier).
3) At the State level, 118 state reference laboratories (SRLs) (3rd tier) which include an additional SRL which has been nominated at State General Hospital, Naharlagun in Oct 2010, under a microbiologist at the hospital.
4) Districts level, i.e., all ICTC & Blood banks.

New Initiatives

- Appointment of regional technical specialists by CDC through PCI who are carefully handholding the labs towards quality and accreditation
- Appointment of 81/118 TOs in the SRLs
- Development of Consortium of NRLs on Quality which has become operational for HIV, HCV and HBV since April 2010
- Reassessment of NRLs on NABL format
- Application by six NRLs for NABL accreditation of which two have been pre-assessed, preparation by four labs for application in the next quarter and review of functioning of two NRLs is proposed.
- Viral load linkages for second line ART centres
- Seven regional workshops of SRLs from April-Sept 2010

Ideas emanated regarding next phase (NACP IV)
Vision:
Universal availability and routine access to quality assured HIV related laboratory services

The **priorities** for NACP IV include the following:

- Positioning laboratory services as a distinct component of the program at the national level
- Focus on quality in laboratories at all levels
- Integrating HIV testing into all existing healthcare delivery systems (such as NRHM, IDSP, RNTCP and other public and private sector establishments) in a phased manner

VOLUNTARY COUNSELING AND TESTING (VCT)

This involves (a) increasing availability and demand for voluntary testing, especially joint testing of couples (b) training grass root level health care workers in HIV/AIDS counseling; (c) providing counseling services through all blood banks in India and through STI clinics.

It is envisaged that one voluntary testing center would be established in each district. Counseling before test (**Pretest**) prepares the client for undergoing test and changing his/her high risk behavior whereas counseling after the test result (**post-test**) prepares the client to understand the meaning of positive and negative test, benefits of changing risk behavior and handling the marital and sexual needs confidently.

Counseling

Counseling is the face-to-face communication by which counselor can help the person/client to make decisions and act on them. Its main aim is problem-solving. Prerequisites of counseling are- a) Knowledge based, b) Acceptable, c) Accessible, d) Maintain confidentiality, e) Client oriented. At the same time counselor should be skillful, communicative, knowledgeable, cooperative, empathic, maintaining confidentiality, good listener, non-commanding and having non-condemning attitude. The counseling in AIDS Program includes-

1. Pretesting counseling involves assessing the client' motivation for testing and assessing risk and window period; providing information about nature, stages, testing, transmission and prevention

of HIV/AIDS; soliciting informed consent; and providing support.
2. Post-testing counseling for a negative results includes assessing client's readiness; stating the result; assessing the window period; providing information on prevention and staying negatives.
3. Post-test counseling for a positive result comprises assessing the coping up of the client during waiting period; assessing readiness to receive the result; stating the result; providing support-psychological, financial and material; prevention and life style education.
4. Counseling of terminally ill AIDS patients includes providing support, dealing with discrimination, strengthening coping of, providing material, financial and technical support, working with family members and employers, maintaining risk-reduction behavior, having regular medical treatment and follow-up and providing anticipatory grief counseling.

HIV Testing

The Government feels that there is no public health rationale for mandatory testing of a person for HIV/AIDS. On the other hand, such an approach could be counterproductive as it may scare away a large number of suspected cases from getting detected and treated. HIV testing is carried out on a voluntary basis with appropriate pretest and post-test counseling and is in line with the WHO guidelines on HIV testing. A *comprehensive HIV testing policy* has been formulated that stated:

1. No individual should be made to undergo a mandatory testing for HIV,
2. No mandatory HIV testing should be imposed as a precondition for employment or for providing health care facilities during employment,
3. Adequate voluntary testing facilities with pretest and post-test counseling should be made available throughout the country in a phased manner. There should be at least one HIV testing center in each district in the country.
4. Disclosure of the HIV status to the spouse of the person will entirely depend on the person's willingness to share the information. However, the person should be encouraged to share this information with the spouse and family as it helps the person in getting proper home-based care when he is afflicted with AIDS.
5. In case of marriage, if one of the partners insists on a test to check the HIV status of the other partner, such tests should be carried out by the contracting party to the satisfaction of the person concerned.
6. Testing strategies – they are different for different purpose:
   - *Mandatory*: Screening in blood banks for transfusion safety.
   - *Unlinked and anonymous*: Epidemiological surveys, surveillance to monitor the trend of HIV infection in a population.
   - *Voluntary and confidential:* Confirmatory testing for subclinical/ clinical management and voluntary testing.
   - *Need based:* With explicit contact, for research purposes, ethical standards need to be maintained.
7. In case of screening for blood donation, ***a single test*** by Rapid/ELISA is done to eliminate the possibility of HIV-positive blood. In case of epidemiological surveys also the same procedure is adopted, i.e. with ***one or two tests*** either with ELISA or Rapid or Simple with high sensitivity. The testing is anonymous and the result is not given to the person concerned unless asked for. In case of clinical management and for confirmatory testing of HIV status of persons who voluntarily ask for it, the sample will be tested with ***at least two*** ELISA and one Rapid/Simple by a different antigen preparation. The result is given out with proper pretest and post-test counseling.

Enumeration of CD4 Lymphocytes

CD4 count is a prerequisite for starting therapy. HIV selectively targets a subset population of lymphocytes known as CD4. These cells play an important role in fighting against various infections. Infection with HIV brings about a fall in the number of CD4 cells, thereby increasing susceptibility to opportunistic infections. Successful therapy leads to an increase in the number of these cells. It is well recognized now that enumeration of CD4 count is very crucial for monitoring the rate of progression to AIDS, both for initiation of treatment for opportunistic infections, as well as for monitoring the impact of ARV therapy. CD4 cell levels are also a criteria for categorizing HIV-related clinical conditions according to the WHO system for HIV infections (Table 10.5).

Table 10.5: CD4 count and initiation of ARV therapy for Adults

WHO stages	CD4 count	Total Lymphocytes count
IV	Irrespective	Irrespective
III	<350/mm^3	Irrespective
II	<200/mm^3	<1200/mm^3
I	<200/mm^3	Not applicable

Various methods available for counting CD4 are:

- Flow cytometry using laser beams,
- FACS count (compact, closed),
- ELISA,
- Microscopy using immuno-magnetic dynabeads (95% correlation with flow),
- Modified computerized image analysis and counting.

Flow cytometry has been accepted as the gold standard for the estimation of CD4 count, but it is very expensive and unaffordable to most developing countries. WHO has suggested the use of *total lymphocytes count of less than 1200/mm^3* and symptoms of HIV related disease in initiation of ART. These roughly correspond with CD4 count of less than 200 and warrant institution of ARV therapy.

Third-generation testing using enzyme-linked immunosorbent assay (ELISA) followed by western blots misclassified HIV-2 infection. This testing algorithm missed those with early infection if antibodies had not yet developed. Also, patients with dual infection showed cross-reactivity, and the diagnosis of HIV-2 infection was missed. These tests also showed negative HIV-1 western blot findings, requiring HIV-2 western blot testing. Third-generation testing was also indeterminate in acute HIV-1 infection or chronic HIV-2 infection, requiring further testing. Fourth-generation testing was developed to address these problems. Screening for HIV should be done with an HIV-1/2 Ag/Ab combination. If findings are positive, an HIV-1/2 antibody differentiation immunoassay should be performed. If those results reveal positivity for HIV-2 infection, an HIV-2-specific ELISA, RT-PCR, or western blot test should be performed. Two rapid result tests are available in the United States: the ARCHITECT HIV Ag/Ab combination test (an immunoassay) and the Determine HIV-1/2 Ag/Ab combination test (using lateral flow technology). HIV-1 RT-PCR does not detect presence of HIV-2; therefore, patients infected with HIV-2 may have an "undetectable" viral load.

Integrated Counseling and Testing Centers (ICTC)

The HIV counselling and testing services, started in the year 1997, have been scaled up in the recent years. Currently, more than 5233 Counselling and Testing Centres are working at all levels of the public health-care system. The earlier Voluntary Counselling and Testing Centres (VCTCs) and facilities providing Prevention of Parent-to-Child Transmission of HIV/AIDS (PPTCT) services are now remodelled as a hub to deliver integrated services to all clients under one roof and renamed as "Integrated Counselling and Testing Centres" (ICTCs).

Though counselling and testing services have been implemented in India for the past ten years, not more than 25–30% of the people who are living with HIV/AIDS in the country are aware of their HIV status. Under the National AIDS Control Program Phase IV further envisaged the strengthening of services for counselling and testing through the ICTCs every year. For this activity equal participation from private and non-governmental organization is sought. The reach of PPTCT services will also be expanded to provide access to pregnant women every year.

In addition, Provider-Initiated Testing and Counselling will be launched for patients referred from medical providers such as those with tuberculosis, STIs as well as pregnant women. These measures will not only strengthen the prevention and control of HIV/AIDS but also lead to clear benefits to the health outcome of people living with HIV/AIDS. Currently more than 75,000 people who are HIV-positive access the antiretroviral therapy (ART) program and receive free treatment for HIV/AIDS.

The main functions of an ICTC include:

- Early detection of HIV.
- Provision of basic information on modes of transmission and prevention of HIV/AIDS for promoting behavioral change and reducing vulnerability.
- Link people with other HIV prevention, care and treatment services.

Those who are more vulnerable or practise high-risk behavior. These subpopulations include sex workers and their clients, men who have sex with men (MSM), transgenders, injecting drug users (IDUs), truckers, migrant workers, spouses and children of men who are prone to risky behavior. Medical providers also refer patients who have a history of risky behavior or have signs and symptoms suggestive of HIV/AIDS for counselling and testing to an ICTC. The client flow in shown in Figure 10.5.

Types of ICTCs

Broadly, ICTCs can be classified into two types:

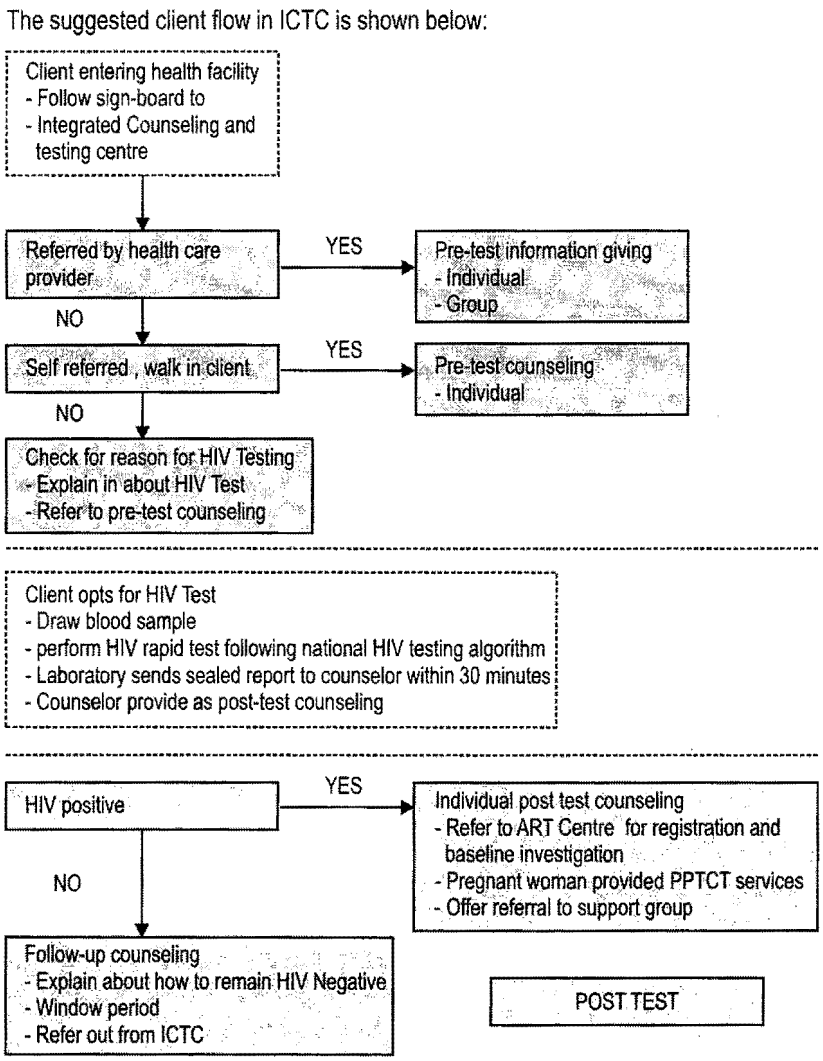
1. Fixed-facility ICTCs

Fixed-facility ICTCs are those that are located within an existing health-care facility/ hospital/centre. A fixed-facility ICTC can be of two types:

1."Stand-alone" ICTC having a full-time counsellor and laboratory technician who undertake HIV counselling and testing. Such facilities exist in medical colleges and district hospitals, and in some subdistrict hospitals. In the National AIDS Control Program Phase-III (2007–12) it is envisaged to have such ICTCs established up to the level of 30-bedded CHCs throughout the country.

2."Facility-integrated" ICTC which does not have full-time staff and provides HIV counselling and testing as a service along with other services. Existing staff such as the auxiliary nurse midwife (ANM)/staff nurse/health visitor/laboratory technician (LT)/ pharmacist are expected to undertake HIV counselling and testing. Such ICTCs will usually be established in facilities that do not have a very large client load and where it would be uneconomical to establish a stand-

Figure 10.5: Client flow in an ICTC


The suggested client flow in ICTC is shown below:
Client entering health facility
- Follow sign-board to
- Integrated Counseling and testing centre
Referred by health care provider
YES
Pre-test information giving
- Individual
- Group
NO
Self referred , walk in client
YES
Pre-test counseling
- Individual
NO
Check for reason for HIV Testing
- Explain in about HIV Test
- Refer to pre-test counseling
Client opts for HIV Test
- Draw blood sample
- perform HIV rapid test following national HIV testing algorithm
- Laboratory sends sealed report to counselor within 30 minutes
- Counselor provide as post-test counseling
HIV positive
YES
Individual post test counseling
- Refer to ART Centre for registration and baseline investigation
- Pregnant woman provided PPTCT services
- Offer referral to support group
NO
Follow-up counseling
- Explain about how to remain HIV Negative
- Window period
- Refer out from ICTC
POST TEST

alone ICTC. Typically, such facilities are 24-hour PHCs as well as private sector/not-for-profit hospitals, private laboratories, public sector organization-run hospitals or facilities, and in the NGO sector. Such ICTCs will be supported by the National AIDS Control Organization (NACO)/State AIDS Control Societies (SACS) to the extent of:

- Supply of rapid HIV testing kits
- Training of existing staff
- Quality assurance
- Supply of protective kits and prophylactic drugs for post-exposure prophylaxis (PEP) for staff
- Supply of information, education and communication (IEC) material required for an ICTC such as flip charts, posters, etc.

2. Mobile ICTCs

It is often seen that high-risk/vulnerable populations are less likely to access fixed-facility ICTCs due to several impediments, the most important ones being distance and timing. Mobile ICTCs can be one way of taking a package of health services into the community. A mobile ICTC consisting of a team of paramedical health-care providers (a health educator/ ANM, counsellor and LT) can set up a temporary clinic with flexible working hours in hard-to-reach areas, where services are provided ranging from regular health check-up, syndromic treatment for STI/ reproductive tract infection (RTI) and other minor ailments, antenatal care, immunization, as well as HIV counselling and testing services. Mobile ICTCs can thus cater to a larger audience and be a more effective preventive intervention by ensuring the reach of services.

Human resources for an ICTC

The ICTC requires a team of skilled persons consisting of the manager (medical officer), counsellor and LT. An outreach worker would be necessary in high-prevalence districts.

Infrastructure

ICTC should be located in a place that is easily accessible and visible to the public. The ICTC should consist of a counselling room and a blood collection and testing room with all equipments.

HIV Counseling

HIV/AIDS counselling/education is a confidential dialogue between a client and a counsellor aimed at providing information on HIV/AIDS and bringing about behavior change in the client. It is also aimed at enabling the client to take a decision regarding HIV testing and to understand the implications of the test results. The steps in HIV counselling are:

HIV pre-test counselling/information: This involves provision of basic information on HIV/AIDS and risk assessment to direct walk-in clients.

HIV post-test counselling: Here the client is helped to understand and cope with the HIV test result:

In case of a negative test result, the counsellor reiterates basic information on HIV and assists the client to adopt behavior that reduces the risk of getting infected with HIV in the future. In case the client is in the window period, a repeat test is recommended. Those clients with suspected tuberculosis are referred to the nearest microscopy centre.

In case of a positive test result, the counsellor assists the client to understand the implications of the positive test result and helps in coping with the test result. The counsellor also ensures access to treatment and care, and supports disclosure of the HIV status to the spouse.

Follow-up counselling: In follow-up counselling there is a reemphasis on adoption of safe behaviors to prevent transmission of HIV infection to others. Follow-up counselling also includes establishing linkages and referrals to services for care and support including ART, nutrition, home-based care and legal support.

Counselling and testing services may be offered to clients who are referred by medical providers or to clients who come to an ICTC of their own volition. The two settings in which counselling and testing can be offered to clients are as follows:

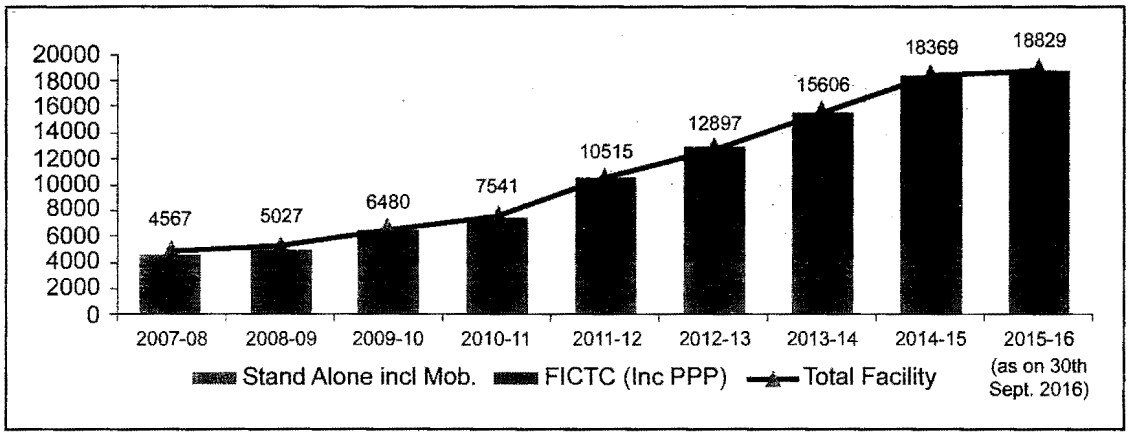
Provider-initiated counselling and testing

Client-initiated counselling and testing or self-referred, direct walk-in.

1. Provider-initiated counselling and testing – "Opt out"

A clinician may offer HIV counselling and testing services to patients under his care. There are three varieties of patients who are offered provider-initiated counselling and testing:

Figure 10.6: Progress under ICTC testing



- Patients who present at a health facility with symptoms suggestive of HIV infection. Examples include patients with pneumonia, TB or persistent diarrhoea.
- Patients attending the health facility with conditions that could be associated with HIV such as STI/ RTI.
- Settings with large client numbers such as pregnant women who register at ANCs. These also include pregnant women who directly come in labor without any antenatal check-up.

2. Client-initiated counselling and testing – "Opt in" or Direct walk-in clients

These are clients who present themselves at the ICTC of their own free will. The motivation to visit and avail of the ICTC services could be based on individual risk behavior or information and advice received, for example, from a friend, sexual partner, or outreach worker/peer educator in an NGO, or from advertisements in the mass media. Here the client is counselled for HIV and then "opts in" or actively agrees to be tested for HIV. Written consent has to be obtained from such clients before testing. HIV testing is followed by regular post-test counselling. Follow-up counselling is provided for those who are in the window period.

HIV Testing and Quality Assurance

Rapid Test

The most common and easiest way to diagnose HIV infection is based on the detection of antibodies to HIV which are generated in the blood of an HIV-infected person. Rapid tests are the most popular method of diagnosing HIV infection. They are user-friendly and can provide quick results to the client. A variety of rapid tests are available and these employ different principles. NACO recommends the use of rapid HIV test kits in an ICTC, which provide results to the client within 30 minutes of the test. The use of rapid test kits which detect >99.5% of all HIV-infected individuals and give false-positive results in <2% of all those who are tested is recommended for use in an ICTC. Testing is done free of cost for all clients in all ICTCs in the government health sector and in all 'stand-alone' ICTCs supported by NACO/SACS. ICTC testing has increased over a period of time (Figure 10.6).

HIV testing and the window period

The window period represents the period of time between initial infection with HIV and the time when HIV antibodies can be detected in the blood (6–12 weeks). A blood test performed during the window period may yield a negative test result for HIV antibodies. These cases may require further testing after 12 weeks.

Emergency testing

For women with an unknown HIV status and in labor, the labor room nurses, resident doctors, or medical officer will provide basic information on HIV/AIDS and about HIV testing. Thereafter, a single HIV test will be offered to determine the HIV status of the pregnant woman and requirement for ARV prophylaxis to prevent mother-to-child transmission. A repeat sample will be collected and tested on the next working

day by the LT of the ICTC to confirm the HIV status.

Estimating baseline CD4 count – HIV-positive pregnant women

Whole blood samples of all pregnant women who are diagnosed to be HIV-positive in an ICTC will be sent to the nearest ART centre with CD4 testing facility for estimation of the baseline CD4 count so that they can be considered for ART.

Quality assurance

Each ICTC will be assigned a "State Reference Laboratory" (SRL). EQAS involves sending of "coded" samples from the reference laboratories to the ICTCs twice a year for testing. In addition, ICTCs should send samples, which will include 20% of all positive samples and 5% of all negative samples collected in the first week of every quarter, for cross-checking to the SRL once every quarter.

NACP IV

Goal: Universal access for people at risk of HIV to access quality counselling and testing services and link all HIV infected persons to receive a continuum of care, support and treatment services.

I. Objectives:

1. To continue, expand and accelerate the coverage of counselling and testing services to at risk population.
2. To increase uptake of HIV testing among identified key populations (Female sex workers, men who have sex with men and injecting drug users).
3. To increase uptake of HIV testing among highly vulnerable groups (STI clients, migrants and other bridge populations).
4. To increase testing and counselling among TB clients through integration of HIV screening as part of TB services and intensifying TB screening and diagnosis at all HIV care facilities.
5. To link all HIV positive individuals with a variety of care, support and treatment services available through the national health programs by the end of NACP IV.

Strategies

1. To continue and accelerate the coverage of counselling and testing services to at risk population:

2. Increasing access to testing and counselling among identified key populations: Increasing the uptake of testing and counselling among identified key population, TB clients, pregnant women, rural populations, STI clients, and the sexually active and vulnerable general population is critical to maximization of case identification in India.

3. Focus on Sexually active and vulnerable population including STI Clients, migrants and other bridge population -Rigorous efforts will be made to increase testing uptake in high prevalence districts among highly vulnerable groups

4. To increase testing and counselling among TB clients: To increase testing and counselling among TB clients through integration of HIV screening as part of TB services and intensifying TB screening and diagnosis at all the HIV care facilities

5. Linking positive individuals with prevention, care and support services.

PPTCT PROGRAM

Studies in India have shown that chemoprophylaxis with Nevirapine reduced the MTCT rate from the reported baseline rate of 33% to 8.4% at birth or 10.1% at age of two months. It is a cost effective way to prevent infection among children. The study also demonstrated that antenatal clinics can be utilized effectively for imparting education to pregnant women about prevention and control of HIV/AIDS through trained counsellors. In addition, special attention would be given to drug prophylaxis linked with infant feeding, nutritional support and contraception. Drugs regimens will be modified and adapted based on emerging evidence of efficacy to prevent mother to child transmission.

NACP IV

Vision: Universal access to comprehensive PPTCT services to pregnant women and appropriate HIV services to their families as an integrated health care package.

Goal : The goal of the NACP IV regarding the PPTCT component is to intensify efforts to work towards elimination of new HIV infections from mother to child and improve maternal and child survival (in the context of HIV)

*{**Definition of elimination:** Reduce new pediatric infection by 90% and to reduce PTCT to <5%}*

Objectives (By end of NACP IV):

- To offer HIV test to all pregnant women accessing services
- To reduce parent to child transmission to less than 5%
- To link all HIV positive pregnant women and exposed babies to care, support and treatment services at the earliest.
- To provide access to family planning services to HIV positive pregnant women
- To Link HIV negative women to sexual and reproductive health services offered by NRHM

Based on the recommendations of WHO (2010), DAC has issued the policy to all States/UTs for nationwide implementation of the multi-drug regimen for PPTCT with effect from 1 January 2014. The regimen advocated by NACO is given in figure 10.7.

OCCUPATIONAL HEALTH: EXPANDING HIV/AIDS RESPONSE IN THE WORLD OF WORK

India has a working population of around 400 million, 93% of whom are in the informal sector. In collaboration with key stakeholders, including employers' and workers organizations, relevant ministries, and civil society NACP-III has developed specific guidelines to strengthen the response of the world of work to HIV/AIDS to mitigate the impact of the epidemic. The guidelines cover work at the national, state and enterprises levels, in the public and private sectors. The key areas would be prevention of HIV/AIDS, management mitigation of the impact of HIV/AIDS on the working population; care and support for infected workers; addressing sigma and discrimination.

UNIVERSAL PRECAUTIONS AND POST EXPOSURE PROPHYLAXIS

Globally there are 1 milllion cases of needle stick injury. Of these 100 get hepatitis B, C and HIV. Accidental exposure like injury by needle stick, or contact of open wound; non-intact skin, or mucous membrane (eyes, nose, or mouth) with blood or other body fluid, should be reported to the supervisor immediately, and it should be ensured that the incident is recorded. The exposed

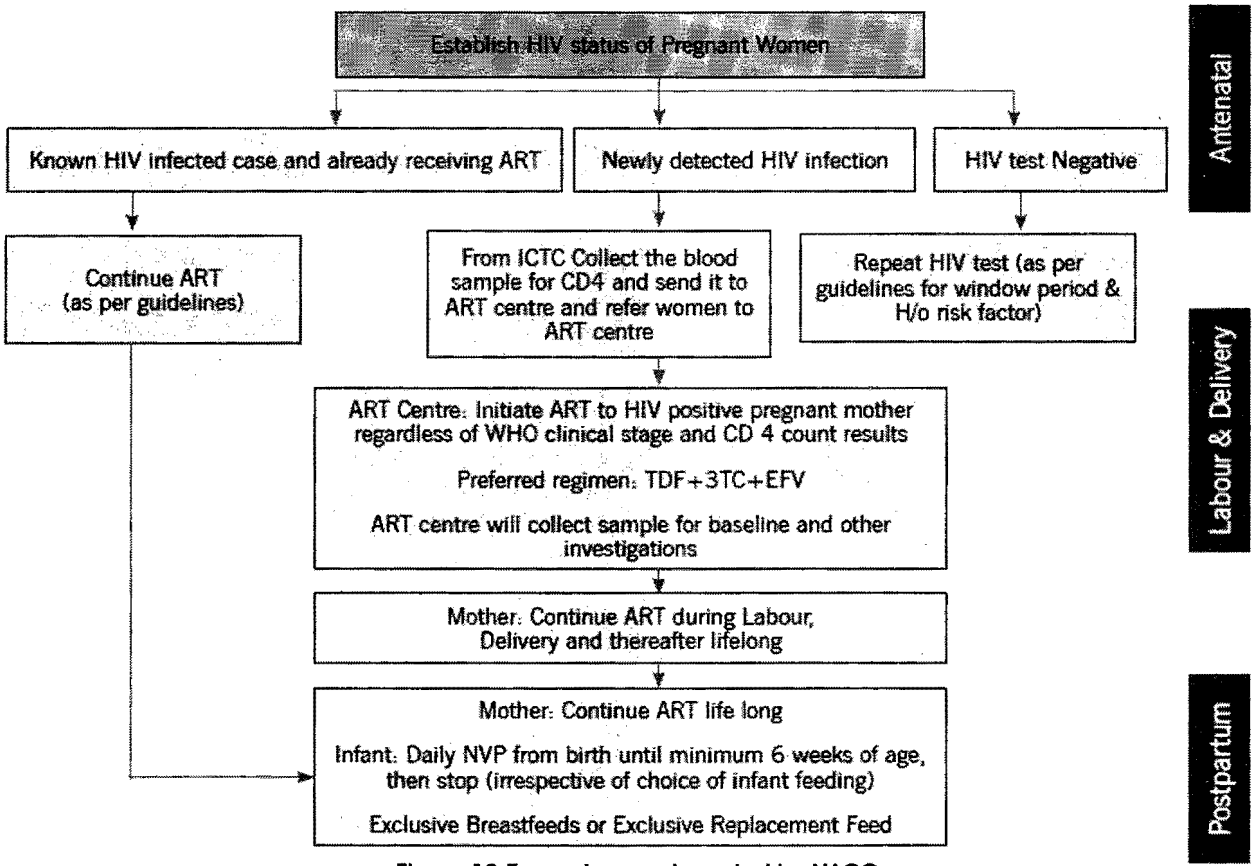

Establish HIV status of Pregnant Women
Known HIV infected case and already receiving ART
Newly detected HIV infection
HIV test Negative
Antenatal
Continue ART (as per guidelines)
From ICTC Collect the blood sample for CD4 and send it to ART centre and refer women to ART centre
Repeat HIV test (as per guidelines for window period & H/o risk factor)
ART Centre: Initiate ART to HIV positive pregnant mother regardless of WHO clinical stage and CD 4 count results
Preferred regimen: TDF+3TC+EFV
ART centre will collect sample for baseline and other investigations
Labour & Delivery
Mother: Continue ART during Labour, Delivery and thereafter lifelong
Mother: Continue ART life long
Infant: Daily NVP from birth until minimum 6 weeks of age, then stop (irrespective of choice of infant feeding)
Exclusive Breastfeeds or Exclusive Replacement Feed
Postpartum

Figure 10.7: regimen advocated by NACO

area should be thoroughly washed with soap and water, and a disinfectant such as alcohol or hydrogen peroxide should be applied. The pricked finger should never be put in mouth reflexly. Further, receiving prompt medical attention following exposure is very important for worker's own health.

Medical Care and Counseling after Exposure
Person after exposure should receive prompt and confidential medical attention. Health care facilities in India like Employee State Insurance Corporation (ESIC) or Central Government Health Service (CGHS), private body should provide follow-up care and all necessary tests to the health care worker. Particularly in the case of a needle stick or exposure by another kind of sharp, vaccination for hepatitis B and/or a gamma globulin shot may be recommended, if the person has not already been immunized. These have been shown to be effective at preventing infection if administered soon after exposure. Workers need counseling to take away fear of infection after exposure. In case of testing for HIV, sessions of pretest and post-test counseling are required (Fig.10.8, 10.9).

Chemoprophylaxis against HIV
Universal precautions are best measures to prevent the occupational exposure of health worker from HIV infected blood or body fluids. Still workers can get exposure to HIV due to various reasons. Following measures are recommended to prevent HIV exposure (Ghate & Paranjee 1999):

1. Rapid HIV testing facilities should be available,
2. Exposure with HIV should be considered as a medical emergency,
3. Chemoprophylaxis should be started immediately or within 2 hours, treatment after 72 hours of exposure is not recommended.
4. The decision to start PEP (Post exposure prophylaxis) is taken after deciding the severity of exposure (Exposure code) and HIV status code of the infecting source (status code)

Basic Regimen: Zidovudine 300 mg BD + Lamivudine 150 mg BD *for 4 weeks (Table 10.6)*

Expanded Regimen: Basic Regimen + Saquinavir600 mg TDS (or any other protease inhibitor) *for 4 weeks* Although the optimal course of treatment is unknown, treatment should be taken at least for 4 weeks (NACO 2002).

Table 10.6: Type of exposure regimens according to security of exposure and status code

Exposure code (EC)	Status code (SC)	PEP Recommendation
1	1	PEP may not be warranted
1	2	Consider basic regimen. Such exposure poses little risk for HIV transmission
2	1	Recommend basic regimen
2	2	Recommend Expanded regimen. Such exposure poses increased risk for HIV transmission
2/3	unknown	Consider basic regimen

The following drugs are only used for post-exposure prophylaxis and supported by the Government of India:

- Zidovudine - 300 mg. twice daily for 4 weeks.
- Lamivudine - 150 mg. twice daily for a period of 4 weeks.
- Indinavir - 800mg. Thrice daily (only when indicated as part of expanded regime).
- Saquinavir-600 mg thrice daily.

Success of this program depends on availability of anti-retroviral therapy and also awareness about the therapy among staff (Shvkani 2011).

SAFE BLOOD PROGRAM

There is no other fluid, which can totally substitute blood in the human body. Blood contains nutrients, oxygen in adequate quantities and helps in maintaining a balanced temperature of the body. In many cases transfusion of blood becomes necessary to save the life of an individual. Therefore, blood should be pure and free from contamination. In case of transfusion of infected blood, it is almost sure that such blood would carry transmissible diseases like hepatitis B & C, syphilis, malaria, and HIV/AIDS.

Challenge

Infrastructure of blood banking services is highly decentralized and did not have adequate trained people, equipment/ supplies and financial resources to provide the quality of services required from a blood bank.

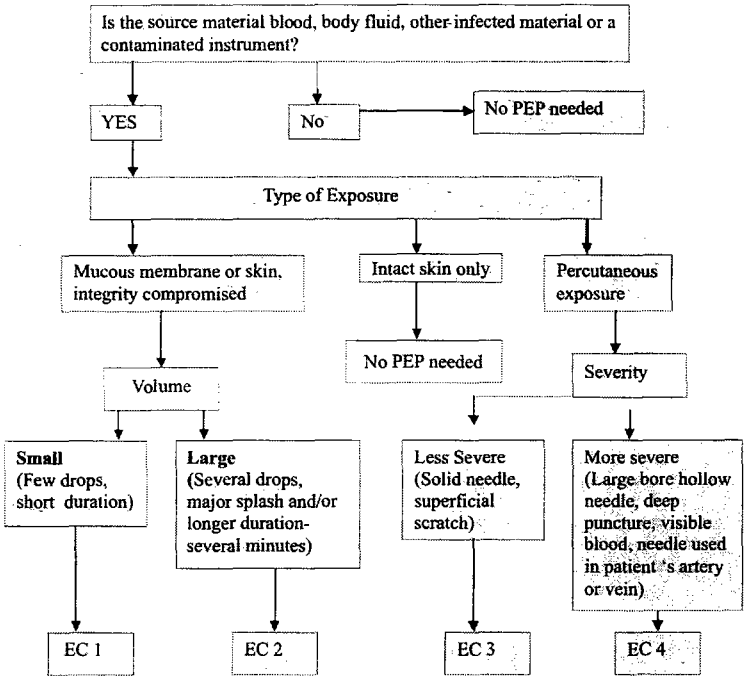

Is the source material blood, body fluid, other infected material or a contaminated instrument?
YES
No
No PEP needed
Type of Exposure
Mucous membrane or skin, integrity compromised
Intact skin only
Percutaneous exposure
No PEP needed
Severity
Volume
Small (Few drops, short duration)
Large (Several drops, major splash and/or longer duration- several minutes)
Less Severe (Solid needle, superficial scratch)
More severe (Large bore hollow needle, deep puncture, visible blood, needle used in patient 's artery or vein)
EC 1
EC 2
EC 3
EC 4

Figure 10.8: Determination of Exposure Code (EC)

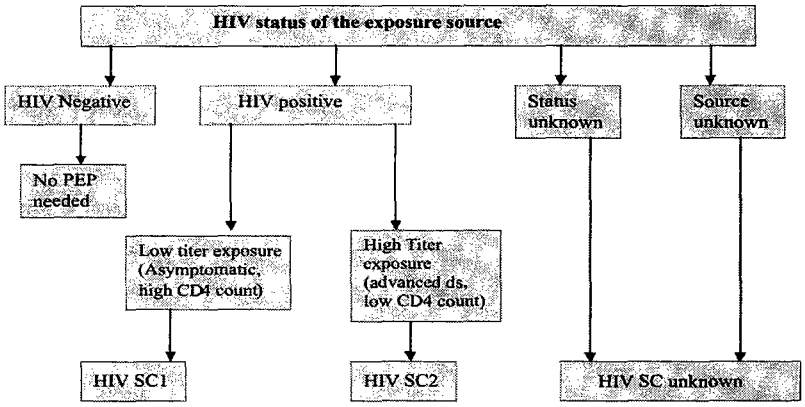


Figure: 10.9: Determination of HIV Status Code (SC)

Another problem is scarcity of blood leading to mushrooming of private blood banks with inadequate infrastructure and standards.

Objectives

To ensure the easily accessible, adequate supplies of safe and quality blood and blood components for all irrespective of economic or social status. For that following responses undertaken:

- To ensure organized blood-banking services at the State/district level;
- To educate and motivate people about voluntary blood donation; and
- To enforce quality control of blood before infusion.

Strategic plan

- Strengthening the National Blood Transfusion Services.
- Ensuring an adequate supply of blood to all blood centers.
- Ensuring safety of blood products.
- Developing facilities for the production of components.
- Developing and strengthening facilities for plasma fractionation.
- Strengthening quality control of blood and blood products.
- Undertaking research on blood transfusion services, operations to improve safety, efficacy and supply.
- Developing and strengthening of effective management, monitoring and evaluation of blood transfusion.

Blood safety is an integral part of the National AIDS Control Program. At the State level in State AIDS Societies, Blood safety officers have been assigned the responsibility to coordinate programs. In order to facilitate the functioning, Government of India provides assistance for staff salary, contingency and transportation of vehicles. The staff provided under this component is, Joint/ Deputy Director, Technical Assistant and Drug Inspectors.

Program Thrust Areas

- Establishment of HIV testing facilities.
- Support for testing for other blood transmissible diseases.
- Modernization of blood banks.

The strategy adopted for testing blood was that, the samples of donated blood were tested unlinked anonymous with either ELISA or Rapid/Simple (kits which test for both HIV-1 and HIV-II) techniques and unit found sero-reactive is discarded by incineration. Based on information on blood screening, the status of seroreactivity in the donated blood is represented in the blood-screening chart.

As per the National Blood Safety Policy, testing of every unit of blood is mandatory for detecting infections for diseases like, hepatitis, syphilis, and malaria apart from testing for HIV. NACO under the Central scheme of assistance provides financial support for blood banks equipment, contingency and purchase of consumables, chemicals and reagents.

Table 10.7: Progress on blood safety over the years

	NACP I	NACP II	NACP III	NACP IV
Total blood banks licensed	685	883	1127	1137
Blood component separation units	42	82	155	258
Modern Blood bank	0	10	28	34
Safe Blood	44 lakh unit	99 lakh unit		

New Initiatives

1) Setting up of Metro Blood Banks as Centre of Excellence in Transfusion Medicine: To improve the blood transfusion services in the country, four Metro Blood Banks are being set-up as Centres of Excellence, in the cities of New Delhi, Mumbai, Kolkata and Chennai. These banks will have State of the Art facilities with 100 percent Voluntary Blood Donation, 100 percent blood components preparation, and a capacity to process more than 100,000 units of blood annually.

2) Plasma Fractionation Centre: Under NACP-III, one Plasma Fractionation Centre with a processing capacity of more than 1, 50,000 litres of plasma, which can fulfil the country's demand has been proposed.

Key strategies for NACP IV

Strategy I: Augmentation of Voluntary Blood Donation

The aim is to achieve 90% of the annual requirement of blood exclusively through voluntary non remunerated donation

Strategy II: Access to safe and quality blood

1. Upgradation of facilities

Key activities

1. To determine the annual requirement of blood for the country, a district wise need assessment of blood.
2. To develop the horizontal and vertical linkages of blood banks and storage centres within the states. This needs to be coordinated by SACS/ SBTCs. The nomenclature and responsibilities of each category of blood bank needs to be defined.
3. Formulation of appropriate guidelines within the provisions of Drugs and Cosmetics Act to facilitate easy transfer of blood within the transfusion network.

Progress on blood safety over the year given in table 10.7.

Blood Screening- standardization and adequate quality assurance of testing protocols and kits/reagents in use .Only those kits/reagents which are evaluated and meet the standards should be provided by the programme

2. Quality Management systems- Developing quality policy, procedures and reporting formats to ensure uniformity in documentation and traceability.

The blood banks need to be aware of all statutory requirements and strictly follow them by introduction of a monitoring and vigilance system.

Strategy III: Appropriate Use of blood and blood products- 80% of the blood collected in existing BCSUs should be converted into components. For sensitization of clinicians, national guidelines should be prepared on clinical use of blood and circulated

Strategy IV: Adequate Implementation Structure at all levels -The blood transfusion service requires an independent implementation structure for an effective and centrally coordinated 'National Blood Program'.

Key activities

The role of the regulatory authority both at central and state level to be clearly defined and linkages established.

Strategy V: Efficient Supply Chain Management (SCM) For addressing the issues of forecasting, lack of reporting, contingency plan and management of supply chain for uninterrupted supply of equipment, consumables and disposables.

Strategy VI: Convergence With NRHM/other departments and Ministries

Monitoring indicators:

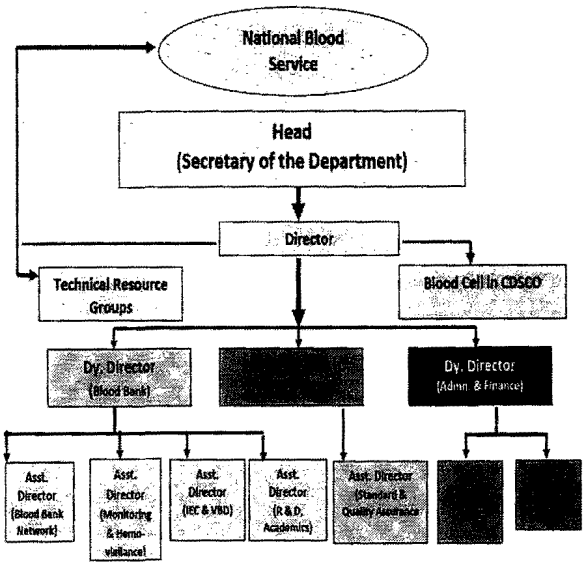
1. % age of collection against the estimated demand
2. % age of blood collected through voluntary blood donation
3. % age of blood separated into components
4. %age reduction in sero prevalence of TTIs
5. %age reduction in discard rate of blood collected

Organizational Structure of Blood Services

National Blood Service is headed by the Secretary health. Director is technical head supported by technical resource groups and blood cell in CDSSO. The Director is supervising 3 Dy. Directors -Blood Bank, Quality Practices, and Administration and Finance. Dy. Director Blood services is assisted by Assistant Directors -Blood Bank Network, Monitoring and hemo-Vigilance, IEC and VBD and R&D Academics (Figure 10.7). Similar kind of structure is formed at the state level.

Figure 10.10: Organizational structure of National Blood Service

At National level:



National Blood Transfusion Policy

Apart from taking the immediate measures, a National Blood Policy has been formulated for the purpose of providing the necessary directions and guidelines for better management of blood transfusion services and improved availability of safe and adequate blood and blood products. Details of this policy are given under Policy Section of this book.

Blood safety measures in India are mandated by law and supported by a network of 815 blood banks and 42 blood components separation centers. In addition special institutions are being set up in 8 states. There are blood transfusion councils at national and state levels. First Referral Units (FRUs) and other centers will have storage and transfusion centers which will function in conjunction with blood banks funded under the NACP. This will need high levels of integration in information, transportation and inventory management.

CONDOM PROGRAM

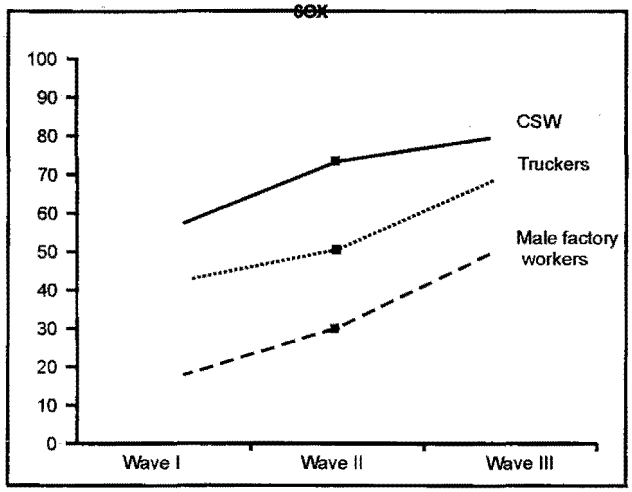
Heterosexual promiscuity constitutes the major route of transmission of HIV. The most successful and practical way to prevent the transmission is the use of condoms according to experience from all over the world and in India. Condoms are not only affordable but also user friendly and an effective possible way to keep the disease away. The program perceived that there should be no moral, ethical or religious inhibition towards propagating the use of condoms amongst sexually active people specially those who practice high-risk behavior. While the use of condom is easy, making a Program to cover the whole country needed careful planning on certain issues.

Results of a prevention program amongst sex workers in Sonagachi, in central Kolkata (West Bengal) indicated that condom uses increased (Figure 10.11). When the project was launched in 1992, 27% of sex workers reported condom use whereas this had risen to 82% by 1995 to 86% by 2001 (Dutta et al.2002). But this increase in condom use has not stopped the increasing trends of HIV positivity in West Bengal. In another study condom use among sexually active 16-24 years old men increased significantly from 61% in 1990 to about 82% in 2000. However, there is increase in sexually transmitted diseases in UK.

Issues Concern

a) Sensitize people for using condoms not only for the sake of family planning but also as the best preventive measures against HIV and STD.
b) Convince the clients and the commercial sex workers about the importance of use of condoms as a means for preventing the HIV transmission.

Figure 10.11: Condom used during last non-regular sex



c) Make available low cost and good quality condoms to the people all over the country easily at the time and place when they need it.

There is a need to focus on other socioeconomic and cultural issues associated with HIV epidemic in India beside condom promotion.

Program Objectives

- To ensure easy access to good quality, affordable and acceptable condoms to promote the safe sex encounters.

Strategies

a) Technical assistance to companies to manufacture condoms in conformity with the International specifications and to improve the quality.
b) Strengthening the existing social marketing structure in the Department of Family Welfare.
c) Introducing an exclusive social marketing scheme of condom promotion by NACO.
d) Strengthening the management ability of Private Voluntary Organization (PVO)/NGOs that promote and make condoms available for STD/HIV prevention.
e) Collaborating with the existing IEC program of the Department of Family Welfare for promoting the use of condoms for achieving the dual purpose of averting conception as well as protecting from STD/HIV infections.
f) Strengthening program management and monitoring systems.
g) Supporting and strengthening the ICMR and Population Research Centers for undertaking research studies on all matters related to the use of condoms and increasing its use particularly among high risk groups.

Implementation

The three major areas in which NACO has significantly made progress in relation to condom programing are:

a. Quality control of condoms,
b. Social marketing of condoms,
c. Involvement of PVOs and NGOs in the program.

The non-lubricated condom 'NIRODH' has already been phased out and manufacturers have started adhering to the new specifications. The laboratories which are authorized for quality testing of condoms are: SGS laboratories, Chennai; Vinita laboratories, Hyderabad; PRK laboratories, Hyderabad; SQAE, Ministry of Defence, Chennai; SQAE, Ministry of Defence, Thirivananthapuram; CIPL, government of India, Appellate Laboratories.

NACO in collaboration with the Department of Family Welfare is providing subsidized condoms to State AIDS Control Societies (SACS) through three schemes namely-

i Distribution scheme,
ii Social marketing,
iii Commercial brand scheme.

General availability of condoms in the community drug stores, important highways, road and railway junctions, public places, luxury hotels, etc. should also be ensured. Schedule 'R' of the Drugs and Cosmetics Act has been amended recently to include condoms for ensuring adequate quality control in their manufacture and distribution.

Indicators

- Percentage of persons reporting consistent use of condoms in sexual intercourse with non-regular partners in the last 30 days.
- Percentage of persons reporting availability of condoms within 500 meters.
- Percentage increase in the number of nontraditional outlets for condoms (75% of all nontraditional).

Use of Condoms

Behavioral Surveillance Survey (BSS) end line (2006) shows a significant increase in consistent condom use from 32.4 per cent in 2001 to 49.7 percent in 2006 among those who had sex with any non-regular sex partners in the previous 12 month. Condom use reported during the last sexual intercourse with any non-regular sex partner has also significantly increased from 40 per cent in 2001 to 58 per cent in 2006. In another report it is found that in high risk people the use of condom is as low as 23% in males and 12% in females. Accessibility of condoms within 30 minutes from the nearest source, which is one of the key determinants for condom use, increased from 46 per cent to 81 per cent.

Targeted Condom Social Marketing Program (CSMP):

The overall condom usage which was 1.6 billion in 2006-07 has reached 2.45 billion in 2009-10, against the NACP-III target of 3.5 billion condom usage per annum by 2012. The number of condoms stocking outlets have also increased from 0.6 million in 2006-07 to 1.2 million in 2009-10. Under Phase-III of CSMP, the total condom sales target for the SMO is envisaged at 47.8 crores condoms during July'2010-June'2011.

FOCUSED EFFORTS ON WOMEN

The program will work through existing organizations/ agencies providing services to women, including support groups of women living with HIV. These organizations would persuaded through advocacy to incorporate HIV prevention and control into their activities and provide technical support to do so. Synergies of existing programs under RCH and ICDS will be strengthened. A gender disaggregated database at national, state, and district levels will be generated with information about women's HIV status. Gender coordination will be achieved among groups working on issues of violence against women, trafficking, sex work, early marriage, conflict situation, and migration in the setting of HIV/AIDS.

FOCUSED EFFORTS ON CHILDREN

The most vulnerable are street children and other children living without family care, trafficking children, children who are injecting drug users, children in care and protection institutions, children of sex workers, and children in conflict with law, children with physical or mental disability and children facing gender-based risks.

NACP-III will seek to strengthen the response of the government of India and NGOs to reduce HIV risk behavior among vulnerable children by integrating HIV/ AIDS prevention activities within their other programs and schemes for vulnerable children and community based interventions such as life skill education, behavior change interventions, psychosocial support, basic services such as education, health, and livelihood opportunities.

FOCUSSED EFFORTS ON YOUNG PEOPLE

The risk perception and behavior of the country's 230 million adolescents (10-19) and 400 million youth (13-35) would determine the future direction of HIV/AIDS. A large number of them are out of school (57% drop out), sexually active, marry early, migrate for work in vulnerable situations, and are exposed to peer pressure and risk environment. Their knowledge of reproductive health, sexual hygiene as well as risk perception is very low. Almost 73 percent of young people have misconception about the modes of HIV transmission. Nearly 33% of reported AIDS cases are in the age group of 15-29 years. NACP-III would respond to these special needs by establishing a network of Youth Friendly Information Services by reorienting the VCTCs and through building alliances with formal and informal youth service sector, organizations of youth volunteers and national/regional youth networks such Nehru-Yuvak Kendras, working rural youth, NSS, Scouts and Guides, Youth Red Cross and NCC working in the student youth and adolescent settings in the universities, colleges and schools will be supported and strengthened to provide youth-health and HIV related information and services.

School AIDS Education Program

Young people are among the group most vulnerable to HIV/AIDS, thus school AIDS education is one of the important programs. It focuses towards student youth to raise awareness levels, help young people resist peer pressure and develop a safe and responsible lifestyle. The program reinforces family values and respect for the opposite sex. The activities include training of teachers and peer educators among students, role

playing, debates and discussions, question box and access to referral services, if necessary. A training module has been developed for the program in consultation with UNICEF and NGOs, which has successfully implemented the program.

CARE, SUPPORT AND TREATMENT

IMPROVED TREATMENT ACCESS FOR OPPORTUNISTIC INFECTIONS AND CONTINUUM OF CARE

Treatment of Opportunistic Infection (OI) is currently provided at district level and should be made available at CHC and PHC levels also. Drugs will be given free of cost in public hospitals. Some good track record NGOs will also be included in treatment of OI. Active TB is the commonest opportunistic infection amongst HIV infected individuals and is also the leading cause of death in PHLA. Linkage in RNTCP and NACP-III is required for better handling of such cases.

ANTI-RETROVIRAL THERAPY

The first drug, which was discovered in 1987, acted on the *reverse transcriptase* enzyme so that pro virus DNA would not be formed. Since then, various drugs acting on the reverse transcriptase have been discovered. Two groups of drugs: 1) Nucleoside Analogue and 2) Non-nucleoside analogue was discovered till 1998. These were the drugs, which acted on the enzyme protease, which helped in the maturation of m-RNA to mature virions. These drugs were known as *protease inhibitors*. So, the anti retroviral drugs, which acts on the various stages of the life cycle of the virus in the human body stop the replication of the virus but does not get the virus out of the human cell where they are firmly integrated. These drugs are very costly however, government of India has pledged to support provision of drug program with the help of DFID, Clinton HIV Initiative, USAIDS, and other funding agencies.

The drugs available in India are as follows:

1. Reverse transcriptase inhibitors
   i. Nucleoside analogue: AZT (azidothymidine, zidovudine) - 100 mg. each tablet; DDC (zalcitadine) - 75 mg. Tablet each; Stavudine - 100 mg. Tablet each; Lamivudine - 150 mg. Tablet each; Didanosine; Di-deoxyadenosine (ddA).
   ii. Non-nucleoside analogue: Nevirapine - 200 mg. Tablet each; Delavirdine, Sustiva, thio benzimidazoline derivatives.
2. Protease inhibitors
   i. Saquinavir
   ii. Ritanavir
   iii. Indinavir
   iv. Nelfinavir

Currently 107 government hospitals are providing ART and CD4 count test free of cost. ART is also available for children in 87 centers. In addition, ART is also being provided by the private sector. NACP-III has scaled up this service to a large number of people through effective public private partnership and community partnership. Priority for treatment in the ART centers would be accorded to :

- Seropositive women in general, particularly those who have participated in the PPTCT program,
- Children below the age of 15 years who have HIV/AIDS,
- PLHA referred from targeted interventions, and
- AIDS patients accessing treatment from government ART centers.

In 2007 the ART will be given to one lakh patients and in 2010 around 184000 would be recruited for ART.

Ensure Treatment Adherence

The impact of HAART (Highly Active Anti-Retroviral Therapy) on reducing morbidity and mortality and its cost-effectiveness depend on high adherence to treatment. In more developed countries, the percentage of patients who are found to be adherent to HAART ranges from 50 to 90%, with the average around 75%. Recently evidence from developing countries shows 60-80% adherence to HAART. Following barriers are identified and need to be handled beforehand to make the program a success:

- There are large number of pills and doses that need to be swallowed;
- Hunger, thirst and fatigue are associated with poor compliance;
- Number and severity of side effects of therapy such as diarrhea, nausea, fatigue, lipodystrophy and neuropathy;
- Psychological problems of being a chronically ill leading to physical and social isolation, loss of life's aspiration, depression and "battle fatigue";

- Lack of trust in the medication's effectiveness;
- Quality of health services – providers apathy, ignorance, lack of information and unable to provide appropriate information, advise and motivation to patient;
- Lack of medicine and other infrastructure to provide ART;
- Stigma and fear of disclosure;
- Sex: women have low level of adherence as compared to men because of certain socioeconomic reasons.

These barriers can be removed by following methods:

- Providing practical tools such as watches, alarms, pillboxes and cash incentives;
- Information, education and advise about the medicines and possible side effects and follow up period improves adherence;
- Individualized adherence – promoting plans tailored to the patient's needs, are useful;
- Social support; and
- Direct observation of ART by social workers, health workers, relatives and family member.

Quality of ART services

Rapid scaling up of services without ensuring adherence and monitoring of drug resistance is likely to make lifesaving first line ART ineffective over a short period of time. Capacity building, effective monitoring and evaluation will be made integral to ART services. This will allow for long term and sustained gains in life expectancy and quality of life for PLHA. Psychosocial support is needed with regard to treatment literacy, adherence compliance, livelihood support and positive prevention. Every ART center will be linked to an NGO/COB or PLHA network for this. Role of private sector is also recognized and will be utilized for the same.

Strategy for management of ART drug resistance

Global evidence suggests that resistance to 1st line ART will occur in 4-8% of cases per year. This means that nearly 25% of those who are on 1st line ART could be resistant to these drugs by the end of 4 years. NACP-III will aim at development of second line drugs policy for ART. The following activities are planned to delay the onset of drug resistance:

- Improving adherence to drugs.
- Monitoring drug resistance so as to modify policy as required.
- Negotiating with government and industry regarding generic second line drugs which are affordable.
- Making available second line drugs to those in need through bulk purchases.

Financing of ART drugs

The program will facilitate linkage with public sector banks or community financing initiatives to set up savings and other self financing schemes to be administrated by NGOs/CBOs, and health insurance to HIV/AIDS patients.

Following targets have been set to be achieved by March 2012:

- Provide free ART to 3,00,000 adult and 40,000 children through 250 ART Centres;
- Achieve and maintain a high level of drug adherence and minimise the number of patients lost to follow up, so that drugs are effective for a longer period of time; and
- Provide comprehensive care, support and treatment by establishing Community Care Centres (CCC).

Link ART Centres: Link ART centres (LACs) were originally planned under NACP-III

In order to facilitate the delivery of ART services nearer to the beneficiaries, it was decided to set up Link ART Centres located mainly at ICTC in the district/sub-district level hospitals nearer to the patient's residence and linked to a Nodal ART centre within accessible distance. Presently, 550 Link ART Centres have been established

Community Care Centres: To Provide a comprehensive package of CST services, the Community care Centres (CCC) have been set up in the non-government sector with the objective of providing psycho-social support, ensure drug adherence and provide home-based care. CCCs are linked with ART Centres and ensure that PLHIV are provided following services

(a) Counselling for ARV treatment preparedness and drug adherence, nutrition and prevention;

(b) Treatment of Opportunistic Infections;
(c) referral and outreach services for follow up; and
(d) Social support;
(e) Tracing patients lost to followup (LFU)

At present, 255 CCCs are fully functional.

Regional Pediatric Centres: Pediatric ART is provided at all ART centres.The Regional Paediatric ART Centres (RPC) serve as Centres of Excellence for Paediatric care including management of complicated OIs, training and research activities Currently, seven RPCs are functional in the country.

Capacity Building for CST

Various training programmes organised under NACP-III include:

- Orientation of faculty of Medical Colleges/ District Hospital (4 days)
- Training of Medical Officers (SMO/MO) of ART centres (12 days)
- Training of Medical Officer of CCC/Link ART centres (LAC) (3 days)
- Training of Counsellors (12 days)
- Training of Data Managers of ART Centres (3 days)
- Training of Laboratory Technicians for CD4 count (2 days)
- Training of Pharmacists (2 days)

Follow up of Pre-ART LFU: All patients registered in Pre-ART and on ART undergo a CD4 test every six months. The ART centre lab technician maintains a daily "due list" of the patients who are due for CD4 testing. This list is prepared from CD4 laboratory register. This list is made available with SMO/MO & during patients visit in that particular month for ART, he is subjected to a CD4 test. Those who do not undergo CD4 test within one week of their due date, need are followed up by phone call to ensure CD4 test is done on the next visit.

ART Plus Scheme: Second Line ART was rolled out in the country at two Centres of Excellence (COE) in January 2008. It has been observed that patients need to travel long distance to access the second line treatment. This issue has resulted in low uptake of Second Line Treatment and also inconvenience and difficulties to patients. In view of these, it was decided to expand the number of centres that can provide Second Line ART. For this, it was planned to upgrade some good functioning ART centres with geographical considerations and label them as 'ART Plus' Centres

LAC Plus Scheme: Initially, the main functions of LAC were monitoring of patients on ART, drug distribution to patients on ART, treatment of minor OIs, identification and management of side-effects and reinforce adherence on every visit. At present there are more than 550 functional LACs. It is proposed to gradually scale up LAC to 1200 by 2015-16 LACs having more than 70 PLHA on ART will be upgraded as 'LAC Plus' under the revised scheme.

Functions of LAC Plus are given below:

- Enrolment of PLHIV into HIV care and treatment (Pre-ART Care)
- Pre-ART management inc. basic investigations and sample collection for CD4 count.
- Follow up of pre-ART patients not eligible for ART.
- Referral of eligible patients to Nodal ART Centre for ART initiation.
- Screening of HIV-TB co infection
- Monitoring of PLHIV on ART
- ARV Drug distribution
- Treatment of Minor OIs
- Identification of side –effects
- Counselling on adherence, nutritional & positive prevention
- Tracing of LFU and MIS

Antiretroviral Treatment

The various levels where HIV care and treatment is provided include:

1. Centre of Excellence (CoE) & ART Plus Centres
2. ART Centres
3. Link ART Centres & Link ART Centre Plus

ART Centres are also linked with Community Care Centres run by NGOs for a comprehensive package of services.

Currently (till March' 2011) there are 306 fully functional ART Centres against the target of 250 by March 2012 wherein nearly 12.5 lakh PLHIV are registered and 420000 patients are currently on ART. In addition, 612 Link ART centre (LAC) have been established wherein, 26023 PLHIV are taking services at Link ART centers. Presently there are 10 Center

of Excellence, 7 Regional Pediatrics centres and 259 Community Care Centres across the country.

Key challenges observed under NACP-III

- **Linkages between ICTC & ART Services**: At present, nearly 70% of PLHIV detected positive at ICTC are accessing treatment and care services.
- **Geographical barrier**s: Long distances, travelling time and costs to access ART.
- **Late entry into ART services**: The median CD4 count at entry is 119 cells/iL only and it is seen there are number of missed opportunities before actual diagnosis of HIV is made.
- **Pediatric Facilities** for early infant diagnosis and enrollment of young children in ART need to be addressed
- **Supply chain management** of ARV and OI drugs needs strengthening and decentralization.
- **Shortage of Skilled staff:** There is shortage of professional and skilled staff.
- **Poor ownership of ART Centres** by the institutions and LAC by Health Systems
- **Irrational** prescriptions particularly that of antiretrovirals is a matter of concern.
- **Long term sustainability** of the free ART program

NACP-IV

GOAL

Universal access to comprehensive, equitable, stigma-free, quality care, support and treatment services to all PLHIV using an integrated approach.

Objectives- CST component NACP-IV

Objective 1: To scale up access to Antiretrovirals and Opportunistic Infections Prophylaxis & Treatment for children, adolescents and adults, free of stigma and discrimination.

Objective 2: To strengthen linkages between ART, ICTC, PPTCT, RNTCP, STI, CCC, DIC and TI.

Objective 3: To strengthen capacity of existing health system for effective delivery of care, support and treatment related services.

Objective 4: To integrate and mainstream care, support and treatment related services within the health system, other department/ministries and private sector.

Objective 5: To strengthen systems for quality assurance, monitoring and evaluation of CST services.

Care of Exposed Child and Early Infant

Objectives of Providing Care for HIV Exposed Infant and Children are:

- To closely monitor HIV-exposed infants and children for symptoms of HIV infection
- To prevent opportunistic infections by providing Cotrimoxazole prophylaxis to all HIV-exposed infants from six weeks of age
- To identify HIV status early through early diagnosis of infant/child and final confirmation of HIV status at 18 months by HIV antibody test
- To provide appropriate treatment including ART as early as possible
- To reduce HIV related morbidity and mortality and improve survival.

Progress under NACP

ART Scale us in India is encouraging as shown in (Figure 10.11).

CHILDREN INFECTED AND AFFECTED BY HIV/AIDS

Pediatric Care

The child-focused Balasahyoga & CHAHA programs in 4 states (all of Andhra Pradesh and parts of Maharashtra, Tamil Nadu and Manipur) for last 5 years (Balasahyoga which covers 68,000 children) and in the case of CHAHA for 3.5 years. Other state-based initiatives include the Samastha program (Karnataka Health Promotion Trust) and Jatan project (Gujarat).

Orphans

Children orphaned (age up to 18 years and loss of either or both parents) due to HIV suffer the double handicap of loss of parents and stigma attached to HIV. Often, they are cared for by the extended family. But the program has to be attentive to the needs of children who may not have any one to care for them and to link up with other service providers to address their condition. Following steps are required: a) baseline data on number of orphans - AIDS and non-AIDS, school dropouts, homeless; b) identify counseling centers and build up capacity for counseling; c) ensuring treatment and support for the infected/ affected children and mothers; d) advocacy for support to orphans and other affected children from

government and non government sources, including community and PRI institutions; e) ensuring school attendance and access to child health care; and f) supporting home based/foster/institutional care for infected /affected children

COMMUNITY CARE AND SUPPORT PROGRAMS

A successful ART program requires close to 100% compliance. This would need community based psychosocial and livelihood support. NACP-III proposes to achieve this through effective linkages of ART centers with NGOs/CBOs to provide outreach services. Community care centres wherever needed [One centre per 5 districts in high prevalence states, and one centre per ten districts in low prevalence] will be developed.

People Living With AIDS (PLWAs)

Apart from providing counseling before declaring the HIV status, the Government is making efforts for the social and economic well being of these people by ensuring:

(a) Protection of their right to privacy and other human rights; and guarantee equal rights to education and employment as other members of the society;

(b) Proper care and support in the hospitals and in the community;

(c) HIV status of a person is to be kept confidential and should not affect the rights of the person to employment, his or her position at the workplace, marital relationship and other fundamental rights;

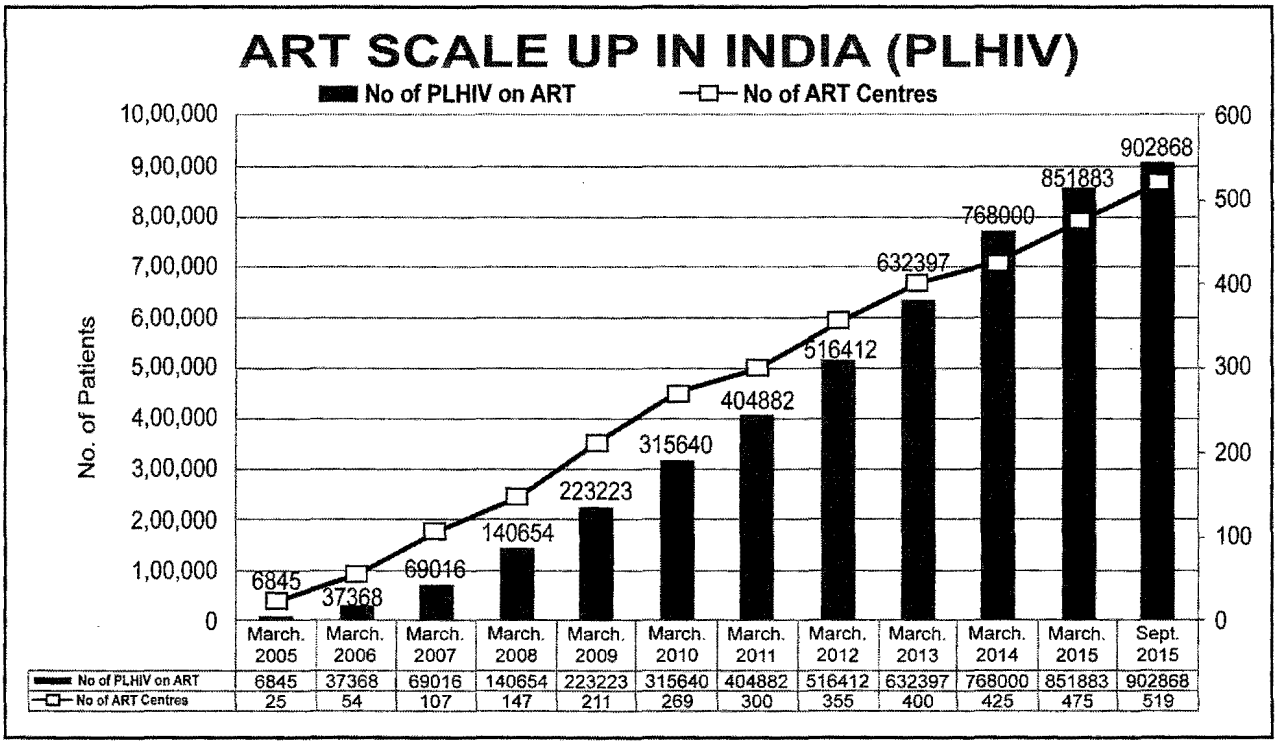
(d) HIV-positive women should have complete choice in making decisions regarding pregnancy and childbirth. There should be no forcible abortion or even sterilization on the ground of HIV status of women. Proper counseling should be given to the pregnant women for enabling her to take an appropriate decision;

(e) Actively encourage and support formation of self-help groups for group counseling, home care and support of their families and members too;

(f) Participation of NGOs is to be encouraged and supported for this purpose;

(g) Initiate intensive advocacy and sensitization among doctors, nurses and other paramedical workers so that PLWAs are not discriminated, stigmatized or denied of services. Training of health personnel in diagnosis, rational treatment and for follow up

Figure 10.10: ART Scale up since 2005 in India



	March. 2005	March. 2006	March. 2007	March. 2008	March. 2009	March. 2010	March. 2011	March. 2012	March. 2013	March. 2014	March. 2015	Sept. 2015
No of PLHIV on ART	6845	37368	69016	140654	223223	315640	404882	516412	632397	768000	851883	902868
No of ART Centres	25	54	107	147	211	269	300	355	400	425	475	519

of HIV-related illness should continue with greater vigor;

(h) Efficient referral system, community-based services and home-based care; and

(i) Clinical management of HIV/AIDS requires strict enforcement of bio-safety and infection control measures in the hospitals as per the universal safety precaution guidelines. Adequate supply of bio-safety equipment and its proper utilization during treatment of HIV-infected persons are emphasized. Adequate facilities, drugs, and equipment for treatment of opportunistic infections, proper disposal of plastic and other wastes and injecting needles are also emphasized upon. There should be integrated comprehensive care into existing health Programs -

Home and neighborhood: Village health care workers, or community volunteers, traditional health attendants with basic health care supplies, like ORS and Vitamin A are the most basic requirements at the peripheral levels. They should be trained for working in collaboration with religious and traditional health workers. Home based and family members have to be trained for a community based care also along with basic and palliative treatment, psychosocial support and education.

Health subcenters: Workers in these subcenters should be trained for management of common day to day problems of people suffering from HIV/AIDS.

Health centers and out patient departments: Health staff in these specialties should be strengthened to provide the necessary comprehensive care for disease based on syndromic approaches (flowcharts), nursing care support for health workers or volunteers based in the community and supervision of care providers in the homes of people with HIV/AIDS.

District Hospitals: District Hospitals are usually staffed with specialists, general medical officers, nurses, paramedics and support staff for the next level of care. They should coordinate with NGOs and community based health and development programs. Clinical, nursing and specialist care will be made available by providing proper training.

Provincial and Regional Hospitals: Provincial and regional hospitals and general urban hospitals serve as referral institutions and also provide care to all who attend. Major clinical specialties are usually available. National referral and academic hospitals provide all medical specialities, extensive laboratories and wide range of expertise for individual clinical care and national policy guidelines in collaboration with health authorities.

PLHA are a crucial resource pool for an effective, relevant and sensitive response to the epidemic and should be recognized as necessary partners in community programs to be involved at all levels. Extra efforts are require to improve the quality of life of PLHA and improving their livelihood.

HIV/TB COORDINATION

Challenges

1. **TB/HIV program level coordination**: lack of full time nodal officer for HIV/AIDS in C and D category districts
2. TB/HIV activities not implemented in HIV care settings like LACs, CCCs and the NACO Targeted Intervention projects for HRG
3. Limitations of TB diagnostic tool for TB and MDR-TB among PLHIV
4. **Limited access of HIV test for TB patients** due to great deficit in number of HIV testing facilities compared to TB testing facilities under RNTCP. Non-collocation of these facilities too is also a factor
5. **Linkage of HIV infected TB patients to ART:** Only about 50% of diagnosed HIV infected TB patients are linked to ART centres and care and support. Reason being that TB treatment (DOTS) is available in all health centres across the country whereas ART is initiated only at 300 odd ART centres, which calls for long distance travel and out of pocket expenses for the patient.

National Framework for Joint HIV/TB collaborative Activities

TB/HIV coordination framework to reduce mortelity in given in fig. 10.12.

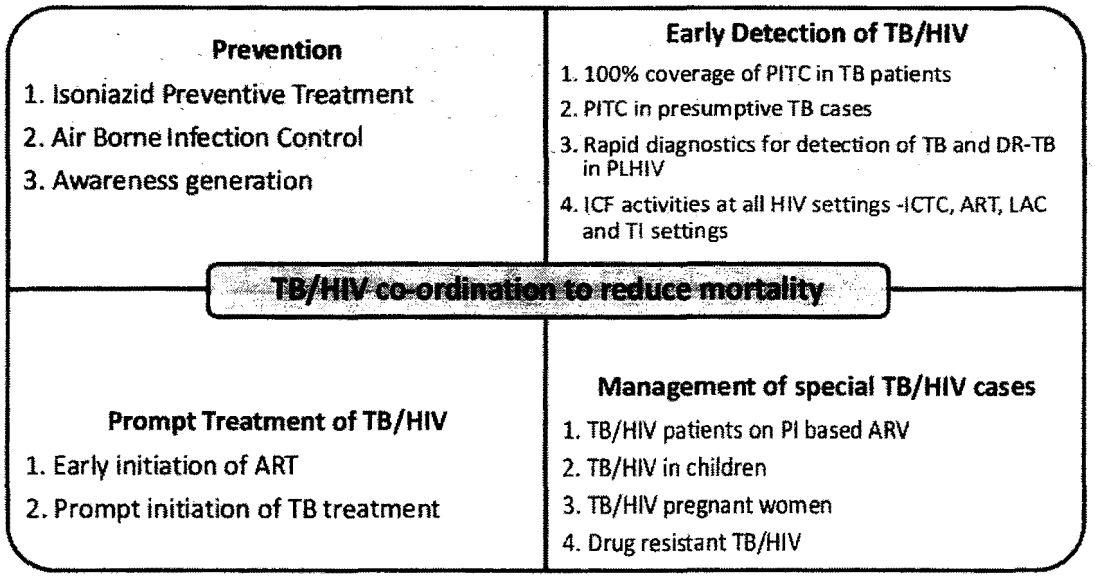
Strategy for NACP IV

1. **Early detection of HIV/TB** by

a. All TB patients to have their HIV status known

b. Expansion of intensified TB case finding to all High Risk Groups through TI projects

Figure 10.11. TB/HIV Coordination


Prevention
1. Isoniazid Preventive Treatment
2. Air Borne Infection Control
3. Awareness generation
Early Detection of TB/HIV
1. 100% coverage of PITC in TB patients
2. PITC in presumptive TB cases
3. Rapid diagnostics for detection of TB and DR-TB in PLHIV
4. ICF activities at all HIV settings -ICTC, ART, LAC and TI settings
TB/HIV co-ordination to reduce mortality
Prompt Treatment of TB/HIV
1. Early initiation of ART
2. Prompt initiation of TB treatment
Management of special TB/HIV cases
1. TB/HIV patients on PI based ARV
2. TB/HIV in children
3. TB/HIV pregnant women
4. Drug resistant TB/HIV

2. **Early institution of care** for HIV-infected TB patients

a. Enable linkage of all HIV infected TB patient to ART care and support and cotrimoxazole prophylaxis therapy

b. Initiation of ART in HIV infected TB patients irrespective of CD4 count as per WHO guideline

3. **Prevention** of TB among PLHIV

a. Early initiation of ART in "all PLHIV" (CD4 count less than 350), to minimize incident TB

b. Adoption of Isoniazid Preventive Therapy policy based on evidence generated in the country

c. Implementation of Airborne Infection Control measures like administrative, environmental and personal protection at ART centres /LAC etc

Program Targets:

Existing

1. All states to conduct quarterly TB/HIV working group meetings and >90% DCC meetings
2. Increasing trend in number of clients referred for TB diagnosis at ICTC and ART centres
3. More than 80% TB patients registered in RNTCP to have their HIV status known
4. More than 80% HIV-infected TB patients to be linked to CPT and ART

New:

1. More than 80% TB "suspects" to have HIV status Known in high HIV prevalence settings;
2. 100% ART centres to implement air borne infection control guidelines; and
3. More than 80% of eligible PLHIV to be initiated on IPT.

STRENGTHENING THE CAPACITIES AT DISTRICT, STATES AND NATIONAL LEVELS (INFRASTRUCTURE, SYSTEM & HUMAN RESOURCES)

NACP III will further strengthen the capacity building process through multiple strategies in order to respond to the needs and evolving challenges of the epidemic. There would be a multidisciplinary standing committee (epidemiologist, economist, microbiologist, civil society representative, marketing, communication, public health specialists, researchers etc.) on training which will identify the training needs, potential institutions capable of functioning as training and resource centers (academic, institutions, NGOs), negotiate with identified institutions for agreement on training strategies and modules and developing/hiring capacities. These centers would also help States plan their trainings, offering periodic trainings to which States can nominate their trainees and ensuring quality of training.

In addition, capacity-building efforts will focus on the areas of program management, finance and procurement at National, State and District levels.

Capacity building of NACO, SACS, District AIDS control units

Recruitment of staff would be more rational, demand based. All staff of SACS and District AIDS Control Units will receive refresher training annually. For capacity development in specialized areas such as management, finance and procurement, separate and suitable programs will be conducted including exposure visits.

Sustained Technical and Training Support to Public/ Private agencies, NGOs, CBOs working with PLHA

NACP III, being a highly decentralized program, will need capacities being built up among implementing partners -NGOs/CBOs

Mainstreaming HIV/AIDS and Partnership Development

HIV need to be handled with multisectoral approach. This can be done by enabling all employees and clients of the sector to protect themselves by providing information and facilitating preventive activities as part of their routine functioning, care of PLHAs in their sector and providing support to HIV prevention and control programs. The district planning process under National Rural Health Mission offers an opportunity to dovetail HIV/AIDS related services into the general health services.

Convergence with RCH, TB and other MOHFW programs

- Identification of areas where RCH, TB and other health system programs could have scope for synergy (Blood safety: District blood bank managed by NACP and blood storage by RCH. STI/RTI: with RCH) with AIDS Control Programs.
- Convergence committee could detail out the responsibilities and sharing of resources in condom programming, STI/RTI treatment, PPTCT through an NACP-RCH convergence plan.
- IDSP and HIV could also share data and analysis.

Mainstreaming Government Departments/ Agencies and other public sector institutions

- Advocacy with concerned departments and partner agencies.
- Identifying of programs within the health sector, which have a synergy with HIV program. Development of linkages with other health programs including sharing of infrastructure and human resources.
- Identification of other ministries/departments/ institutions who impact on and/or are vulnerable to impact of HIV.

Coordination and partnerships with donors, stakeholders and interest groups (private sector, voluntary & faith based groups, CBOs, professional bodies & other civil society)

NACP III will make a joint plan that brings together programs implemented by different agencies as well as funds invested by each. There would also be joint analysis of results and sharing, monitoring, periodic evaluation of progress and to take remedial action where needed.

Capacity Building Needs specific to Prevention & Care & support, Monitoring and Evaluation

Civil Society: a) Training of community members in participatory mapping; b) increased capacity to plan and implement TIs for all HRGs; c) capacity building of community members and peer educators to develop leadership, community mobilization, legal literacy and advocacy skills. Sharing of experiences within and between NGOs and SACS.

STRATEGIC INFORMATION MANAGEMENT SYSTEM

With the development of a common plan and inclusion of districts in the planning and implementation process, the M&E process would be redesigned so that information needed by different levels are made available to that level and only information needed and to be used are collected and analyzed. Evaluation would be supplemented by joint monitoring by partners and civil society evaluation process. In addition to the M&E needs of the individual programs there would

be a common set of agreed indicators, which will monitor movement towards the agreed objectives of the common goal. Lessons learned from ongoing M&E systems established under various national programs will need to be incorporated.

It is also necessary to have a Strategic Management Information Unit that can analyze and make available to program managers results of data analysis, which is needed for management (Fig 10.13). This would bring together all sources of HIV/AIDS information, such as BSS, Sentinel Surveillance, Computerized Management Information System (CMIS), published literature and reports, indicators prepared by various sources and partners, and other program specific information including **FMIS** (Financial Management Information System), analyze.

Establishing one nationwide strategic information, monitoring and evaluation system

Computerised Management Information System (CMIS):

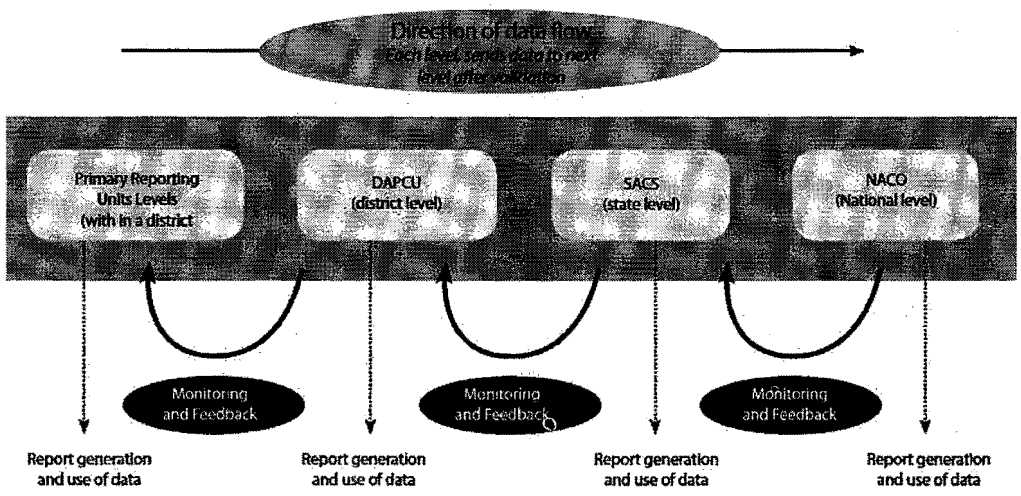
- Strengthening the CMIS system and making it more appropriate and user friendly for the States.
- Developing community friendly information systems to collect data and providing feedback to the community.
- Developing indicators for the common State plan and institutional arrangements to collect data from different implementing partners, analyzing them and monitoring progress.
- Hardware and software procurement
- Training of M&E personnel and staff on data collection, analysis and dissemination of information.
- Biannual review of M&E with program officers
- Generating transparency through publication of M&E data and results of analysis
- Providing evidence on whether a specific intervention is effective.
- Permits appraisal of process, inputs and outputs.
- Compilation of data which can be used for advocacy.
- Tracks trends in utilization of services.
- Mapping of behavior changes concurrently.

SURVEILLANCE

This would involve Behavior Surveillance Surveys (BSS), HIV Sero-surveillance (HSS) including measurement of HIV incidence, Surveillance for STIs and other markers, e.g. Hepatitis B, Hepatitis C etc., AIDS case reporting, HIV associated morbidity and mortality reporting, HIV and STI drug resistance surveillance and other methods/sources of data (e.g. ongoing surveys) where a full fledged surveillance system is not needed. Objective of surveillance would be to estimate the incidence, prevalence, morbidity and mortality as well as to identify behavioral and biological markers on progress of prevention:

Two types of BSS is conducted a) Annual risk assessment at the district level (using a simplified methodology) and b) methodologically rigorous BSS

Figure 10.13: Data flow in SIMS


Direction of data flow:
Each level sends data to next level after validation
Primary Reporting Units Levels (with in a district
DAPCU (district level)
SACS (state level)
NACO (National level)
Monitoring and Feedback
Monitoring and Feedback
Monitoring and Feedback
Report generation and use of data
Report generation and use of data
Report generation and use of data
Report generation and use of data

at State level (a more elaborate system) to be done once in three years

- Surveillance for STIs, HBV and HCV and other surrogate markers of HIV in the general population and high-risk groups.
- Sentinel surveillance of OIs
- Sero-surveillance for estimation of prevalence of HIV in general and high risk populations
- Laboratory based surveillance of pediatric infections
- Studies to estimate incidence of HIV
- Periodic studies (once in two years) to estimate mortality from AIDS

National Integrated Biological and Behavioural Surveillance 2014-2015

The main objective of BSS is to provide repeated measures on behavior for observing trends in high-risk behavior among selected population groups. A set of 9 indicators were used in the three waves. The BSS indicators are as follows:

A Knowledge Indicators

1 Proportion of respondents who cite 2 acceptable ways of preventing STDs.
2 Proportion of respondents who know condoms prevent STDs.
3 Proportion of respondents who cite 2 acceptable ways of preventing HIV/AIDS.
4 Proportion of respondents who know that condoms prevent HIV/AIDS.

B Behavior Indicators

5 Proportion of respondents who report heterosexual intercourse with a non-regular partner in the last year.
6 Proportion of respondents who report condom use during last sexual intercourse with non-regular sexual partner in the last year.

C Urethritis prevalence

7 Proportion of male respondents who report symptoms of urethritis during last year.
8 Proportion of male respondents who sought treatment from qualified medical practitioners for urethritis in the last year.

D Appropriate perception of risk indicators

9 Proportion of respondents with risk behavior who perceive that they can get HIV/AIDS.

NACO implemented Integrated Biological and Behavioural Surveillance (IBBS) to generate evidence on risk behaviours among High risk groups (HRGs) to support planning and prioritization of programme efforts at the district, state and national levels.

The National IBBS is the largest bio-behavioural study of its kind in the world. It was implemented across six population groups comprising Female Sex Workers (FSW), Men who have Sex with Men (MSM), Injecting Drug Users (IDU), Transgender (TG), Migrants and Currently Married Women (CMW) in high outmigration districts. The methodology adopted for the National IBBS was community based cross-sectional survey design using probability-based sampling. Blood specimens, under national IBBS, were collected using Dried Blood Spot (DBS) method. HIV testing was Unlinked Anonymous Testing with informed consent. DBS specimens were tested for HIV, following a Two Test Protocol. All positive and 2% of negative specimens were re-tested at the National AIDS Research Institute (NARI) under external quality assurance.

FSW

A total of 27,007 FSW samples were analyzed across 73 domains in 28 States/Union Territories. The median age of FSWs across most states was between 28 and 30 years, two third of FSWs were literate, two third of FSWs were currently married, half of the FSWs were dependent on sex work for their income and among the remaining who had an additional source of income, the predominant occupation was 'labourer' followed by 'maid servant'.

Sexual behaviour: Median age at first sexual intercourse among FSWs was 18 years while median age at initiation of commercial sex work was 22 years at the national level. Median duration in sex work was six years nationally. The most frequently reported primary place of solicitation was home (33%), followed by rented room (20%), public places (16%), lodge / hotels (11%) and brothels (10%). Use of cell phones for contacting/ getting clients was reported by three fourth of FSWs.

Partner types and condom use: Over three fourth of FSWs reported having occasional clients (79%); among these FSWs, 94% reported condom use at the

last sex act. Eighty two percent of FSWs reported having regular clients; and among these FSWs, 91% had used condom during the last sex act. Sixty two percent of FSWs reported having a regular male partner, such as spouse, lover, boyfriend or other live-in sexual partner.

Anal sex and condom use: Among FSWs who had occasional clients, one fifth reported that they had anal sex with these clients in the last one month. Among them, 88% of FSWs reported condom use at the last anal sex and 64% reported consistent condom use during anal sex in the last one month.

Alcohol and other Substance use: Close to one third of FSWs reported consuming alcohol in the last 12 months. Alcohol consumption was higher among FSWs in the northeastern states such as Manipur, Mizoram, Nagaland, and Arunachal Pradesh where more than 60% of FSWs reported consuming alcohol; a higher proportion of FSWs than the national average reported that they had injected drugs, in the states of Manipur (11%), Mizoram (15%), Puducherry (11%) and Gujarat (9%).

Self-Reported STI: Nearly one half of the FSWs reported that they had experienced one or more symptoms of STI in the last one year. A majority of these FSWs reported seeking treatment from either NGO (49%) or Government clinics (49%) for their last STI episode.
Stigma and Discrimination: More than one fourth (27%) of FSWs felt that they had been treated disrespectfully by their family, friends or neighbors because of being an FSW. About one fifth (21%) of FSWs had perceived that they had been treated differently in a health facility because of being an FSW.

HIV testing: Eighty four percent of FSWs who had heard of HIV/AIDS, reported that they had ever tested for HIV; among these FSWs almost all (99%) reported that they had tested in the last 12 months.

Exposure to programme services: Nearly 90% of FSWs had been exposed to one or more HIV/ AIDS-related services during the 12 months preceding the IBBS. 71% of FSWs reported that peer educators had met with them at least twice in the last month, 17% had received at least 40 condoms in the last month and 64% of FSWs had received a regular medical check-up (RMC) in the last three months preceding IBBS.

HIV Prevalence: HIV prevalence among FSWs at the national level was recorded as 2.2% (95% CI: 1.8 - 2.6). HIV prevalence among FSWs in Maharashtra was recorded as 7.4% (95% CI: 4.5 – 11.9) and 6.3% (95% CI: 4.1 - 9.5) in Andhra Pradesh.

MSM
The median age of respondents was 28 years nationally and ranged between 24 and 30 years across different states. The majority of MSM reported that they were never married (64%). Nationally, the median age at first sexual experience among MSM was 16 years. One third of the MSM reported having their first sex with a male/hijra and nearly one half of MSM reported that they had ever sold sex (48%) to another male. More than half of the MSM self-identified as predominantly Kothi i.e. receptive partner (51%), followed by double decker (24%) and Panthi i.e. penetrative partner (19%). Over half of the MSM reported having a regular male partner (54%), defined as lover, boyfriend or live-in-partner, who is another male. Most of the times they use condom. Paying and paid male partners and sex with Hijra are prevalent who are having regular sex and in majority use condom.

Close to half of the MSM across the country reported that they ever had vaginal sex with a female (48%) and among them 68% of MSM reported currently having a regular female partner. About 45% of MSM reported using condom at last sex with their regular female partner. One fourth of them are paying for female partners.

Overall 51% of MSM reported consuming alcohol in the last 12 months. Among those who consumed alcohol, 56% reported using it before or during sex with a partner. About 3% of MSM reported injecting drugs in the last 12 months and among them, close to one half reported sharing needle and syringe (47%).

Over one fifth of MSM (21%) reported having one or more STI symptoms in the last 12 months. Close to one fifth of MSM (17%) perceived that they were treated differently by those known to them due to their

MSM status. About 13% of MSM across the country perceived that they were treated differently in a health facility because of being an MSM.

Majority have heard of either HIV or AIDS and they were aware about places where HIV testing is available. Seventy eight percent of MSM reported that they had received one or more HIV/ AIDS services in the last 12 months. Prevalence of HIV among MSM recorded was 4.3% (95% CI:3.7 – 5.1). MSM in the state of Andhra Pradesh recorded a HIV prevalence of 10.1% (95% CI:7.4 - 13.8).

Intravenous Drug Users

The median age of respondents was 30 years nationally (ranged between 24 and 35 years) and it was younger in many of the north-eastern states. A majority of IDU across the country were literate (84); 43% of IDUs were currently married and 43% were unmarried. Nineteen percent of IDUs were unemployed and four-fifths (39%) were working as laborers. The median age at initiation of drug use was 19 years. Close to three fourth (76%) of IDUs started drug use by means of non-injecting forms; more than half (61%) had started with oral drug use or smoking form, another 16% by sniffing/chasing and one fourth (23%) had started by injecting method.

Over one third of the respondents injected Heroin followed by Buprenorphine. Between 7% and 11% of IDU had injected Pentazocine, Spasmoproxyvyon, Brown Sugar or sedatives/ hypnotic drugs such as Diazepam/ Calmpose, Nitrazepam/ Clonazepam/ Avil/ Phenargan.

Among the northeastern states, Heroin and Spasmo-proxyvyon were the predominant drugs. About half the IDUs had obtained a new needle/ syringe from NGO peer/ outreach worker/ drop in center (46.3%); 30% from chemist/hospital and 5% from friends or fellow drug users. NGO out-reach worker/peer educator/drop in center were the main source of new needles & syringes in most of the states. Two fifth of IDUs had injected in their homes, while one fifth had injected in streets/ park locations in the last three months. Eighty three percent of IDUs had injected in a group during last injecting episode. The most common needle/ syringe disposal method was throwing in a dustbin (30%) or around the injecting sites (26%).

Over 80% of IDUs at the national level reported ever having sex with a female. The median age at first sex among IDUs was 20 years. Seventy percent of IDUs who had sex with a female had a regular female sexual partner; Condom use at the last sex act with a regular female partner was practiced by 41% of IDUs and consistent condom use was practiced by 16%.The prevalence of HIV recorded among IDUs at the national level was 9.9% (95% CI: 9.0-10.9).

Current Challenges

1. Multiplicity of data systems and communication loops

Currently, different software for different program components are in use i.e. CLHA/PLHA for ART, individual reporting for ICTC apart from the main CMIS software. The usage of different software hinders timely sharing and usage of the information for tracking referrals and linkages between different components of NACP

2. Multiplicity of Indicators and changing data capture formats

There are currently more than 100 indicators being tracked across the different NACP program components. The multiplicity of indicators leads to tremendous burden of data recording and reporting on program functionaries at all levels Additionally, frequent changes to reporting formats cause a lot of confusion in the field and cause delays and deficiencies in reporting.

3. Data Utilization and Dissemination

The capacity for proper presentation and analysis of data is not uniformly present amongst M&E officers and program managers. With the existing system of CMIS, the M&E team is mostly utilized in data entry in the CMIS software. Analytical capacities at the state level are weak and have not utilized the existing data for planning purposes

4. Data Quality

Currently there is limited availability of standard operating procedures and tools for ensuring data quality at unit level. Also, trainings relating to ensuring data quality have not been provided in many components.

5. Capacity Building

There is no dedicated resource pool of subject matter experts who can provide high quality strategic information support and supportive supervision at the state and district level. Standardized component-wise

modules for training program or M&E personnel do not uniformly exist.

6. Program Monitoring and Management

There are no standardized and regular reviews scheduled for DAPCUs and SACS to enable them to benefit from regular feedback and modifications to their monitoring strategies

7. HR Issues

There is continuous staff turnover at facility, SACS, an NACO levels and there is unbalanced workload amongst various SACS with some catering to hundreds of facilities in a given state with no additional support.

INFORMATION EDUCATION AND COMMUNICATION (IEC) AND SOCIAL MOBILIZATION

Communication continues to be one of the most important strategies in the fight against HIV/AIDS. In the absence of a vaccine or a cure, prevention is the most effective strategy for the control of HIV/AIDS. In India, the majority of the population is still uninfected. It, therefore, becomes imperative to continue intensive communication efforts that will not only raise awareness levels but also bring out behavior change.

Information, Education and Communication (IEC) is a process that informs, motivates and helps people to adopt and maintain healthy practices and life skills. It aims at empowering individuals and enabling them to make correct decisions about safe behavior practices. IEC also attempts to create an environment which is conducive and supports access to treatment and services for those already infected.

If communication has to be effective it must be in the local language and idiom, keeping in mind social norms, cultural beliefs and sensitivities of the community. Above all communication programs must give space for interaction, clarifying doubts, addressing misgiving on the issues of sex and sexuality, which are traditionally not discussed openly in a conservative society.

In India, therefore, development of appropriate and effective IEC strategies for HIV/AIDS is one of the biggest challenges not only in the health but also in the development sector. Major findings of various studies are:

- Most individuals do not have accurate and complete information on HIV/AIDS;
- The link between STD and AIDS is not clear to most people;
- STDs are not taken seriously, since they are curable;
- There is a belief that HIV transmission and AIDS is found in only limited groups, such as foreigners, homosexuals, sex workers and drug users;
- The IEC campaign and targeted interventions have demonstrated changes in knowledge, perception and behavior; and
- A Prevention Indicator Study has demonstrated a rise in awareness levels from 68% to 94% in some of the urban areas and 9% to 35% in rural areas.

IEC strategy

- At the national level IEC division in NACO has been set up for political and media advocacy, creation of a supportive environment that reduces social stigma and discrimination and provides better access to services. This makes policy and guidelines and is also responsible for monitoring and supervising the IEC activities undertaken by the State AIDS Control Societies.
- At the state level the IEC activities have been decentralized keeping in mind the need to respond to local priorities and communication in local languages.

Objectives of the Strategy

a. To raise awareness, improve knowledge and understanding among the general population about AIDS infection and STD, routes of transmission and method of prevention.
b. To promote desirable practices such as avoiding multi partner sex, use of condom, sterilization of needles/syringes and voluntary donation of blood.
c. To mobilize all sectors of society to integrate messages and programs on AIDS into their existing activities.
d. To train health workers in AIDS communication and coping strategies for strengthening technical and managerial capabilities.
e. To create a supportive environment for the care and rehabilitation of persons with HIV/AIDS.

Components of IEC Strategy

- Use of Mass Media
- Advocacy at various levels
- Inter-Sectoral collaboration
- Training
- Involvement of NGOs
- Research

National level IEC Activities

NACO besides involving professional agencies to design and develop mass media campaigns is utilizing the various media units of the Ministry of Information and Broadcasting such as Directorate of Field Publicity, Song and Drama Division and the Press Information Bureau for outreach in the rural areas and the regional press.

Electronic Media

NACO is utilizing the massive outreach of Doordarshan and private satellite channel for telecast of messages on HIV/AIDS prevention and control during prime time. These include messages on sexually transmitted diseases, blood safety and voluntary blood donation. Some of the specific activities are as follows:

- Spirit of Unity Concert,
- Telecast of film stars spots,
- All India Radio,
- AIR-FM,
- Rural Outreach and Press Activities,
- National AIDS Telephone Helpline.

NACO sponsored 50 episodes on HIV/AIDS in the tele-serial "Kyonki Jeena Isika Naam Hai" covering migrant, truckers, and children living with HIV.

Print Media

The IEC division of NACO has prepared several packages of materials (flashcards, posters, stickers, leaflets and guide book) aiming at various population groups, to be used by the outreach workers, health workers and peer educators working in government as well as non-government organizations.

Red Ribbon Express

Red Ribbon express is having 5 coaches-each for staff and dancer, auditorium, testing, counseling, exhibition and care and support. It covers 180 stations, 15000 gram panchayats and 50,000 villages. The main purpose of this red ribbon express is to increase the awareness and providing services to the remote areas of the country.

Family Health Awareness Campaigns

Family Health Awareness Campaigns are organized on a regular basis to generate awareness and provide service delivery for control of STI and RTI infections. Government of India responded under NACP-II to the problem of STD/RTI by reaching masses and vulnerable population. Campaigns in the form of camps associated with rallies have been organized during specified days announced by the government in 1999, 2000 and 2001. In the camps all trained doctors and paramedical workers are available with fully equipped centers and dispensaries. The beneficiaries are registered, provided education material on STD/RTI and HIV/AIDS.

MULTILATERAL COLLABORATION

The World Bank has participated in funding a major part of the National AIDS Control Program during the last five years. The Theme Group of UNAIDS consisting of six UN-based organizations will have to play a very effective role in acting as a coordinating agency between the Government and the UN agencies in formulation and implementation of programs for prevention of HIV/AIDS. Government's policy is to promote international cooperation to ensure optimal utilization of resources to avoid unproductive duplication of efforts.

Bilateral cooperation which has been developed with countries like USA, UK, European Union and others will be extended further to take up specific intervention programs. Areas of interest, which are common to the neighboring countries like drug use, labor migration, socioeconomic status of women and socially handicapped persons, etc. could be the common ground for regional cooperation. This component would promote collaboration among the public, private and voluntary sectors. Activities would be coordinated with other programs within the Ministry of Health and Family Welfare and other Central Ministries and Departments.

- Ministry of Human Resource Development (Dept. of Youth & Sports) involved in implementation of "Universities Talk AIDS" Program of the National Service Scheme (NSS) covering 158 universities, 5000 colleges and 2000 senior secondary schools.

- National Council of Education Research & Training (NCERT) has been involved in development of school curriculum package for integration of HIV/AIDS into school education (extracurricular activities).
- A national consultation on the integration of HIV/AIDS into school education has been organized under the auspices of UNAIDS by UNESCO, UNFPA, and UNICEF with financial support from NACO and the active involvement of the Department of Education and five key states where these activities have been implemented.

Table 10.8: Progress in achievement of targets under NACP IV

S. No	Indicator	2012-2013		2013-2014	
		Target	Achievement	Target	Achievement
1	New Targeted Interventions established	180	218	300	246
2	STI/RTI patients managed as per national protocol	64.2 lakh	60.33 lakh	68 lakh	67.7 lakh
3	Blood collection in DAC supported blood bank	NR	NR	55 lakh	57,48,190
4	Proportion of blood units collected by Voluntary blood donation in DAC Supported Blood Banks	90%	84.3%	80%	84%
5	Districts covered under Link Worker Scheme (Cumulative)	163	160	163	162
6	Clients tested for HIV (General clients)	130 lakh	104.55 lakh	102 lakh	130.30 lakh
7	Pregnant Women tested for HIV	90 lakh	82.94 lakh	102 lakh	97.52 lakh
8	Proportion of HIV+ Pregnant Women & Babies receiving ARV prophylaxis	75%	94%	75%	84%
9	HIV/TB Cross Referrals	11 lakh	13.28 lakh	12 lakh	14.88 lakh
10	ART Centres established (Cumulative)	400	400	420	425
11	PLHIV on ART (Cumulative)	6.40 lakh	6.32 lakh	7,10,000	7,68,840
12	Opportunistic Infections treated	4.3 lakh	6.08 lakh	2.9 lakh	4,35,808
13	Campaigns released on Mass Media - TV/Radio	9	10	9	9
14	New Red Ribbon Clubs formed in Colleges	500	531	500	800
15	Persons trained under Mainstreaming training programmes	6.5 lakh	5.19 lakh	3 lakh	3.75 lakh
16	Social Marketing of condoms by DAC contracted Social Marketing Organisations	35 crore pieces	39.02 crore pieces	35 crore pieces	56.45 crore pieces
17	Free Distribution of Condoms	44.5 crore pieces	46.17 crore pieces	36 crore pieces	33.6 crore pieces

Follow-up is expected between NACO and the Department of Education with support from the UN System.

- Nehru Yuvak Kendra (NYK) is involved in the implementation of non-formal educational approaches and rural outreach programs on HIV/AIDS through its national volunteer network in communities in the country.
- The Ministry of Information & Broadcasting has been of assistance through its Directorate of Audiovisual Publicity (DAVP), the Song & Drama Division, All India Radio and Doordarshan (national television service) in providing time and forums for the dissemination of public service programing and messages on HIV/AIDS prevention and care.
- Ministry of Railways in 1994 undertook a study of risk behaviors amongst its employees with assistance from UNDP and further plan of action has been designed.
- Ministry of Defence (Health Services) conducts IEC programs and HIV screening within defence populations with assistance from NACO.

AIDS VACCINE

Vaccines stimulate the body's immune system to provide protection against infection or disease. Vaccines are the most powerful public health tools available. Vaccines against HIV are being developed, and they are in various stages of clinical trial but at present none have proven effective.

Vaccinologists are working simultaneously on two major approaches to designing preventive HIV vaccines: engaging the immune system to block infection, and training the body to recognize and destroy cells infected by HIV.

Blocking Infection: The Antibody Response

All licensed viral vaccines are effective in preventing disease by stimulating the immune system to produce protective antibodies. But HIV's extraordinary ability to mutate serves as a molecular disguise, allowing it to constantly evade antibodies from latching on and neutralizing the virus. Some relatively rare antibodies are, however, known to be able to neutralize a wide spectrum of HIV variants. Researchers suspect that a vaccine that elicits similar antibodies might be able to neutralize HIV before it has an opportunity to establish a lasting infection. The close study of broadly neutralizing antibodies could reveal how that might be accomplished.

Until 2009, researchers had only a handful of such antibodies to use as a reference to design vaccines capable of this feat. But in September 2009, researchers reported the isolation of two exceptionally potent broadly neutralizing antibodies. Since then, dozens of such antibodies have been identified by these researchers and IAVI's partners at the Vaccine Research Center (VRC) of the United States National Institutes of Health, as well as other researchers. The structural and biochemical analysis of these antibodies are yielding valuable clues for vaccine design.

VACCINE STRATEGIES IN CLINICAL TRIALS (2016)*

Vaccine Concept	Vaccine Strategy | *Phase of research (Locations of trials)*
Pox-Protein	ALVAC/gp120 MF59 adjuvant *Phase VII (South Africa)*
Pox-Protein	ALVAC/AIDSVAX *Phase II (Thailand)*
DNA	DNA + IL-12 adjuvant through electroporation + VSV HIV gag vaccine, *Phase I (US)*
Pox-Protein	ALVAC/AIDSVAX *Phase II (Thailand)*
DNA + MVA	DNA + MVA *Phase I (Switzerland, US)*
DNA/Protein	DNA/AIDSVAX *Phase I (Uganda)*
Adenovirus	Ad4-mgag and Ad4-EnvC150 *Phase I (US)*
Adenovirus	Ad26.Mos.HIV + Ad26. MVA or gp140 boost *Phase VII (Rwanda, South Africa, Thailand, Uganda, USA)*
Protein	gp140 *Phase I (US)*
Lipopeptide	LIPO-5 *Phase VII (France)*
Adenovirus	Recombinant Adenovirus 26 Vector *Phase I (US)*
Adenovirus	Ad35.RSV.FA2 with Ad26.RSV.FA2 boost *Phase I (US)*
Recombinant Vector	rAAV1-PG9DP *Phase I (UK)*
Replicating Vector	Replicating Ad26 + mosaic insert *Phase I (US)*

Select vaccine strategies in ongoing clinical trials. Some strategies studied in more than one ongoing trial. For more concepts visit www.avac.org/pxrd.
Source: AVAC Prevention Research & Development Database (PxRD), www.avac.org/pxrd

Destroying Infected Cells: The Cell-Mediated Response

The other arm of the immune response involved in clearing viral infections is known as cell-mediated immunity (CMI), in which the body's T cells (including the type targeted by HIV) work together to destroy cells in the body that have already been infected by HIV. Vaccinologists employ several strategies to design vaccine candidates that might teach the immune system how to target HIV-infected cells. Two of the major approaches are:

Introducing bits of HIV's genetic code into naked loops of DNA that are taken up by human cells

Alternatively, inserting those genes into viruses—or vectors—that do not cause disease and have been engineered to be incapable of multiplying after they enter their target cells

In either case, the production of proteins encoded by these genetic vehicles teaches the immune system how to recognize an HIV-infected cell and destroy it. More recently, researchers at IAVI and elsewhere have sought to develop vectors that retain the ability to multiply safely after delivery in the hope that their persistence and replication will induce stronger, broader and more durable immune responses to the HIV proteins they bear.

There are 9 phase II & I trials and 21 phase I are going on. The WHO-UNAIDS HIV Vaccine Initiative is collaborating with national authorities and scientists working with HIV vaccine development and evaluation in different continents.

Mapping of Vulnerable Population

For evidence based planning of all interventions for HIV prevention and for care, treatment and support of people living with HIV/AIDS, vulnerable populations are mapped in order to identify location, size, and trends in movement. While mapping gives us a macro picture, at state levels, every NGO is expected to conduct a needs assessment in its proposed area of operation to ascertain the baseline information in terms of existing high risk behavior patterns and availability of services. Thirty states have already completed detailed mapping of vulnerable populations so as to earmark the areas where these interventions need to be prioritized. The mapping is being conducted by external agencies of repute to address the needs of scattered high risk core groups, wherever identified.

OTHER ASPECTS OF THE PROGRAM

Indigenous Systems of Medicine (ISM)

In a scenario where anti-retroviral drugs are extremely expensive, there is a great need to look into the indigenous system of medicine like Ayurveda, Unani and Siddha apart from Homeopathy. Some of the medicines in these systems have the potential of reducing the viral load in the body of the patient thus ensuring a healthier and longer life with the infection. Some of the research projects are sponsored in Homeopathic and Siddha systems of medicines and are receiving encouraging response. It will pursue a policy of sponsoring research in ISM and Homeopathy for development of drugs.

The Drugs and Magic Remedies Act requires amendments to stringently deal with cases of unscrupulous persons taking advantage of the misery of HIV-infected persons and defrauding them of huge sums of money. A massive awareness campaign has also been launched to make people aware of the dangers of such medication prescribed by unqualified persons indulging in quackery.

Legislation

- Goa Public Health Act Amendment of 1985 (Section 53.I.vii) allowed the public health authorities and police discretion to isolate people with HIV/AIDS but repealed in 1996.
- Railway Board Administrative Notification of 1989 designating HIV/AIDS as "infectious disease" which can allow denial of passage but rescinded in 1996.
- Draft legislation in 1989 Session of National Parliament, which was evaluated as extremely prejudicial to rights of PLWH/As withdrawn after intervention of WHO and national authorities.
- 1992 Administrative Notification from Minister of Health & Family Welfare (GOI) to all State Governments directing them to ensure nondiscriminatory access to treatment and care for PLWH/As in all Central and State Government health care institutions.
- The Government has, by Administrative Order, required the screening for HIV of all units of blood to be used for transfusion purposes.

- Mumbai High Court Judgment was held in May 1997 that employers cannot base employment decisions on HIV status of employee.

COMMENTS

1. *Political Commitment:* There is insufficient commitment to combating the epidemic at government level (BMJ 2002). Many Indians in position of power refuse to accept that their country faces a grave threat from the epidemic. And as the epidemic spreads, the battle against AIDS is mired by a lack of consensus on the extent of the pandemic, the "right strategy" to combat it, and how to deal frankly with sexuality (Lancet 2003). In early 2003, then the Indian Health Minister told the press that the country's AIDS program had to focus on sexual abstinence and faith rather than just condoms. But according to Peter Piot of UNAIDS a combination approach is required (Choudhury 2003) to reach the desired results. Political commitment needs to be sustained for continuous support of program.
2. Due to the *stigma* attached with AIDS/HIV, people living with disease often face discrimination in health care and employment and are prevented from fully participating in society. However, the program does not give emphasis on amendment of legislation to stop this discrimination. Such amendment can be carried out in "The Person with Disability (Equal opportunity, Protection of Rights and Full Participation) Act 1995". There are incidence of people being turnout from government hospital and losing their jobs because of their HIV status. Similarly, HIV positive children are not allowed to get admission in school (Ind Express 2007; 15 June) that denied the rights provided in equal opportunity legislation. Rehabilitation of sex workers, hijra, transgender who are HIV positives, is neglected in the program which needs special budgetary allocation according to Chhabra (2007).

   There are reports of live burial of HIV patients in Pupua New Guinea because of wide spread fear that such patients would transmit infection to other members of the family and community by living together or sharing same rooms (*Navbharat Times* 2007; 28th August).
3. *Mutli-lateral Collaboration and role conflict:* Most of the public health programs implemented by the Governments of developing countries have been planned or advised by WHO with the evidence based interventions, e.g. small pox, EPI, primary care, DDT spraying, MDT for leprosy, polio surveillance, DOTs for TB control. Some believe that there is an urgent need for WHO & UNAIDS to provide such central leadership for formulating clear plans of action for HIV/AIDS Control. The preventive strategies should emphasize only the feasibility, clear programs that are urgently required to control the epidemic, and should not contain vague, humanistic plans to incorporate all aspects of the disease, which dilute the strategies and make the task impossible to implement. Plans of actions to achieve the specific goals should be clearly spelled out (Bhattarai 2001). On other hand there is a feeling that why should international agencies interfere in local planning and administration on health. The roles of both international agencies and local bodies including state and central government should clearly be specified.
4. *Initially no targets were fixed* for the program to achieve. The program cannot be evaluated properly due to nonexistence of indicators. Except raising awareness no other activity seems to be logical. However, emphasis was shifted later more on blood bank, STDs control, and Condom distribution. Still the program has not been able to generate the felt need in the general and professional communities of the country.
5. *Sentinel surveillance* of HIV in TB patient can also be used as an indicator of the extent of spread of HIV in a particular region beside in ANC and STD patients (Tripathy et al 2002). Instead of assumption based estimates evidence based rates figures should be derived. The number of HIV-infected adults and children in India in the year 2006 has been estimated as 2.5 (2.0-3.1) million, down from 5.7 (3.4-9.4) million in 2005 (UNAIDS 2006).

   In order to facilitate comparison, estimates were derived for five years starting from 2002 and it is found that the epidemic is stable at the national level, although at the state level some high prevalence states showed a decline and some in the low prevalence areas showed an increase in the epidemic. However, the decline was significant only in Tamil Nadu. Further, in several districts of

high and low prevalence states, HIV prevalence among ANC women was more than 1%. The new emerging areas with high HIV transmission have been identified. The HIV prevalence among IDUs remains stable. This abundantly makes it clear that the lowered estimate does not indicate a decline in the epidemic but a correction for some incongruities in the data and in the previous method of estimation (Pandey 2008).

6. *The pitfalls of expanding anti-retroviral treatment in India and in developing countries:* Access to ART could be expanded at the expense of other vital health care services, or could divert resources away from the prevention of HIV transmission. A focus on ART could also 'over-medicalize' the response to HIV/AIDS, and turn attention away from the political, social and economic determinants of the epidemic.

   Ambitious targets of total coverage /partial coverage such as 3/5 initiatives compromise on the quality of long-term outcome of care. Insufficient community and patient preparation, erratic and unsustainable drug supplies, and inadequate training and support of health care providers could result in low levels of treatment adherence, tending to an increased threat of drug resistance.

   Such demand will focus on non-government supply and private providers. This approach can weaken the capacity of the public sector health care system still further by draining skilled personnel into better-paid independent sector. Opening of ART centers in urban and leaving rural population will increase inequalities.

   NACP III is conspicuously silent on structural socioeconomic vulnerabilities and the root causes of the continuing flow of subpopulation into situations involving high risk behavior. It offers nothing to address these vulnerabilities through creating viable, holistic alternatives for those presently entrapped. Hardly any resources are being dedicated to prevent, rescue, rehabilitate or reintegrate endangered persons and survivors of 'sex-work' to enable to overcome their endangering lifestyles that make them highly vulnerable to HIV/AIDS. The budget allocation are preoccupied with getting high-risk groups and patients to use condoms, lubricants, ART while rehabilitation of their families didn't get priority who will continue to suffer stigma and discrimination in socio-economic opportunities.

   Financial issues in providing Anti-Retroviral Drugs for HIV/AIDS: The development of ART therapy has given a new hope for people living with AIDS. The government of India has initiated anti-retroviral treatment as a part of the National Public Health Program. The estimated financial requirements for treatment is heavy if need to be covered all cases. Against this, when the program was started the NACO has allocated a total of Rs. 113 crore for the treatment part of this intervention. Even under the most conservative estimate, achieving the treatment target in India with the budget will be a challenging task (Bhat & Saha 2005). From the field trials it is found that perinatal transmission of HIV can be stopped completely by ART. It would be more beneficial to include ANC mothers in ART program.

7. *Religious groups* should be included in HIV/AIDS work as they themselves run their own schools, hospital, clinics and orphanages and have very powerful impact on people to accept certain practices. A very positive development has been noted when Buddhist monks joined hands to fight against HIV/AIDS in Thailand (AIDS Action 2000). On other hand political parties based on religions can be restrictive force against the sex education as recently observed in India.
8. Around 85% of the infection occurs through sexual route. There is drop in percentage of people with other routes such as injectable drug users, blood & blood products. This could be due to blood policy and upgradation of blood centers. However there is increase from 2.4% in 2001 to 3.4% in 2004 in perinatal transmission (NACO 2005). ART for HIV positive mother should be strongly considered so that the newborn can be saved. NACP IV has focused on this aspect and needs to be implemented.
9. *Voluntary Testing and counseling (VCT):* NACO has developed a VCT policy that states that "no individual should be made to undergo mandatory testing for HIV" and that "no mandatory testing should be imposed as a

precondition for employment or for provision of health care facilities during employment" (India's armed forces are exempt from this condition). NACO has also developed guidelines for VCT centers, which deal with consent and confidentiality issues. However, many Indians are tested for HIV without their consent or knowledge. It has been reported that over 95% of patients listed for surgical procedures are involuntary tested for HIV; for those who test positive, their treatment/surgery is cancelled (Malavade et al. 2002). Another issue for anyone undergoing an HIV test is that his or her test will in most instances be neither anonymous nor confidential (Solomon & Ganesh 2002). Some Government officials (inc. legislators in Goa and Andhra Pradesh) have even voiced their support of mandatory premarital testing for HIV and are proposing related legislation (Lawyers Collective HIV/AIDS Unit 2002).

10. *Under Utilization of Fund:* Many states and districts are unable to utilize the funds allocated to them for AIDS control activities.
11. *Prevention or Treatment:* With no vaccines for HIV round the corner, anti-retroviral therapy is considered the only option to contain the disease progression once it affects the human body. The drugs do not cure the disease but help in prolonging the life span and have to be taken throughout life. But ARV therapy costs remain an important barrier to treatment. However, initial price for an ARV three drug regimen was about US $ 10,000 per patient per year, high quality generic drug regimens are now available for as little as US$ 140 per person per year. A study by Marselle (2002), on the cost effectiveness of HIV prevention in Sub-Saharan Africa and on HAART indicates that prevention is at least 28 times more cost effective than HAART. In another study (Teixeiria et al 2003) risks of infecting partners were reduced by 60%. However, concurrent increase in risk behavior has been noticed among the study population so the most effective strategy was suggested which includes better counseling and various preventive measures along with ARV therapy. Target Intervention in high risk group strategy is the centerpiece with an allocation of over half of the Rs. 11585 crore direct outlay of AIDS Program (Chhabra 2007). Treatment is far more expensive than prevention, but governments do have a moral responsibility towards providing treatment to people living with HIV/AIDS (Bhat & Saha 2005). Another issue was short supply of drugs which was now reported in some states (Ind Expre 2007; 31st August) and should be checked in future that should not happened.
12. *Community Impact:* Lack of awareness among community members particularly in rural adolescents and youths (Kishore 2003) and implementers of the HIV/AIDS risk and they are unwillingness to admit that this is possible in their community. In recent report it was found that more than 50% youths had sex without condoms.
13. Unsafe blood supply is continued to threat the program. Many of the laboratories are functioning without licence (HT 2009). Blood donation has not improved.
14. Both Thailand and Uganda have demonstrated a reduction in HIV prevalence in the general population. The 100% condom program in Thailand was more than condom promotion; education was an integral component. The Thai data showed a remarkable fall in HIV prevalence in young army recruits. However, this fall in prevalence was accompanied not only by an increase in condom use but, most importantly by a reduction in visits to sex workers (Altman 2004). The major fall in HIV prevalence in Uganda occurred before condoms became available to the program and before they were advocated nationally for protection against HIV infection. The change appeared to have come about largely because of behavior change. Rates of partner exchange came down significantly and more young persons were abstinent for longer. Both these examples have clearly demonstrated the great role of promotive interventions.

Unfortunately, this trend of decline has stopped as found on subsequent investigation in Thailand. The UNDP's report on Thailand (2004) warns that the HIV epidemic is getting worse. A significant number of new HIV infections in the sex trade; more young people drawn into the sex trade as workers/clients; rising experimentation with sex, drugs and alcohol amongst young Thais, including school goers; increasing numbers of "sex workers", particularly "indirect sex-work",

operating in diverse, more difficult to regulate settings, now accounting for a sizeable portion of the sex industry; and authorities expressing an inability to monitor condom compliance in vastly increased direct / indirect "sex-service establishments" (UNDP 2004).

15. *Is abstinence a solution?* It has been found that the abstinence only programs do not seem to affect HIV risk in high income countries compared with usual care, no treatment, non-enhanced program versions, a safer sex program, and an abstinence plus program (Underhiull 2004).
16. *SAFE CONDOM:* The most recent meta-analysis of epidemiologic studies of condom effectiveness was published by Weller and Davis in 2004. This analysis refines and updates their previous report published in 1999 (Davis 1999). The analysis demonstrates that the consistent use of latex condoms provides a high degree of protection against heterosexual transmission of HIV. Using a latex condom to prevent transmission of HIV is more than 10,000 times safer than not using a condom (Carey 1992). It should be noted that condom use cannot provide absolute protection against HIV (BBC 2002). Latex rubber, from which latex gloves and condoms are made, has tiny, naturally occurring voids or capillaries measuring on the order of one micron in diameter. Pores or holes five microns in diameter have been detected in cross sections of latex gloves. Latex condoms will generally block the human sperm, which is much larger than the HIV virus. (A human sperm is about 60 microns long and three to five microns in diameter at the head. But the HIV virus is only 0.1 micron in diameter. A five- micron hole is 50 times larger than the HIV virus. A one-micron hole is 10 times larger. The virus can easily fit through. It's kind of like running a football play with no defense on the field to stop you or shooting a soccer ball into an open goal (Ronald 1992).

    In other words, many of the tiny pores in the latex condom are large enough to pass the HIV virus (that causes AIDS) in its fluid medium. Most of the time the failure of protection from HIV or STDs by the condom is due to its slippage, wrong use, application of lubricant, etc. Condom effectiveness in relation to prevent pregnancy is also taken lower. So in case of HIV there are more chances of exposure while using condom. The public at large may not understand the difference between "condoms may reduce risk of" and "condoms will prevent" HIV transmission. It is a disservice to encourage the belief that condoms will prevent sexual transmission of HIV. Condoms will not eliminate risk of sexual transmission and, in fact, may only lower risk somewhat. Promoting condom stating that it will prevent the HIV transmission has legal liabilities if people contracted AIDS or died after using the condoms the government or NGOs distributed. Latex condoms are sensitive to heat, cold, light, and pressure. The FDA recommends they be stored in "a cool, dry place, out of direct sunlight, perhaps in a drawer or closet." Yet they are often shipped in metal truck trailers without climate control.
17. *Vertical Program:* Evidences throughout the world indicate that vertical programs are not cost effective and inefficient. They do not contribute the general development of health services. AIDS program remained vertical in spite of all other national programs are made integral part of general health services. This is also surprising that country's public audit system continuously criticizes the program performance and supervision, still the program is given huge amount of money.
18. *Sex education:* Sex educational materials prepared by the government have been rejected by the teachers and parents in many states of India. The state governments of Maharashtra, Karnataka, Gujarat, Chhitisgarh, Madhya Pradesh and other states have banned such sex education in schools (Anandhi 2007). This is another set back to AIDS Program. Some researchers have suggested India need alternative strategy for HIV/ AIDS prevention.
19. *Safe Sex:* Noncoital sexual behaviors, which include mutual masturbation, oral sex, and anal sex, are common expressions of human sexuality. Couples may engage in noncoital sexual activity instead of penile-vagina intercourse hoping to reduce the risk of sexually transmitted diseases and unintended pregnancy. Although these behaviors carry little or no risk of pregnancy, women engaging in noncoital behaviors may be at risk of acquiring sexually transmitted diseases.

Most individuals engaging in oral sex are unlikely to use barrier protection. However, sexually transmitted diseases (STDs) may be spread through saliva, blood, vaginal secretions, semen, and fecal matter, especially in the presence of preexisting infections, open sores, or other lesions. HIV transmission correlates highly with HIV viral load of the infected partner, is most likely with receptive rather than insertive activities, and is 5-fold greater with receptive anal sex versus receptive vaginal sex.

Herpes simplex virus (HSV-1) is usually associated with oral lesions and HSV-2 with genital lesions. However, both types can infect oral, anal, and genital sites. Human papillomavirus (HPV) is a highly prevalent, sexually transmitted virus that can cause anogenital and oral cancers as well as benign genital warts. Transmission is less efficient to the mouth versus the genitals. Hepatitis B virus is commonly spread through noncoital sexual activities, as it is found in semen, saliva, and feces. Hepatitis A is transmitted via fecal contamination of the oral cavity and is more common in men practicing oral-anal contact. Although sexual transmission of hepatitis C virus is uncommon, it may occur with preexisting hepatitis B virus and HIV infection and with oral-genital contact. Nonviral STDs associated with noncoital sexual activities include syphilis, gonorrhea, and chlamydia, and there have been a few case reports of chancroid, shigellosis, and salmonellosis.

To counsel patients effectively, clinicians should inquire about specific noncoital sexual activities as well as about intercourse and about the gender of the partner or partners. Consistent and correct condom use should be encouraged. Reducing STD risk factors such as multiple partners may be more effective than discouraging oral or anal sex. Other risk reduction strategies may include abstinence, mutual monogamy, engaging in relatively safer behaviors, and STD testing before initiating sexual activity with a new partner. All sexually active women 25 years or younger should be screened annually for chlamydia, and all sexually active adolescents should be screened for gonorrhea. Lesbians and bisexual women should be screened for STDs according to the same risk factors as other women according to American College of Obstetricians and Gynecologists (2008).

Adolescents who have had vaginal intercourse are more likely to have noncoital sexual activity, including oral and anal sex, versus those who have not had vaginal intercourse (Lindberg et al 2008) In America among persons 15 to 19 years old, 54% of female and 55% of male adolescents had oral sex, whereas 11% of both female and male adolescents had anal sex with opposite-sex partners. STDs can be spread through saliva, blood, vaginal secretions, semen, and feces during noncoital sexual activity. It is also found out that only up to 15% of patients 15 to 17 years old reported condom use during the most recent episode of oral sex.

20. Need to focus on serious impact of HIV on health of women and girls due to following factors: *1. Economics loss:* due to loss of *employment, income* and *asset; 2. Food and nutrition:* became *unaffordable, inaccessible* and *poor quality; 3. Education: school attendance* decreases and drop out increases due to discrimination and low *affordability; 4. Health: there is difficulty in affordability* of services *and serious discrimination; 5. Stigma and discrimination: discrimination in health care, community and occupation settings* is widespread which lead to more suffering of these patients; and Household burden: *Caring for the sick* and *disproportionate household labour* lead to poor health.

SWOT NACP

Strengths

- Political commitment with strong bureaucratic support because this is only program headed by a secretary. This indicates the national priority accorded to this program.
- Organization: In order to effective implementation and ensure local planning, the program has been decentralized through state and district based societies. It has sound organization structure with defined roles and responsibilities.
- Strategies: The program focused on prevention aspect since the beginning. The program has integrated STD control program as both involved

same mode of transmission. In view of multiple mechanisms of transmission, there are different components i.e. TIs, IEC, blood safety, PPTCT. In view of greater risk HIV and TB co-infection, the program provides for VCTC.

- Budget allocation is high with multilateral international collaboration which in turn ensures sustainability.
- Has surveillance component including both sentinel and behavior surveillance.

Weakness

- Stigma is still present even among educated class which directs that the program should be more effective to address social determinants of disease. Still the program has not been able to generate the felt need in the community.
- There is conflicting roles of national and international agencies.
- Surveillance provides data but not based on population which has led to wrong projections of estimates in the beginning.
- Access to ART has been expanded at the cost of other vital health services and components despite the fact that prevention is more cost effective than treatment.
- Under utilization of funds have been reported in many states.

Opportunities

- WHO and UNICEF should provide central leadership and uniform guidelines worldwide.
- Indian pharmaceuticals are strong and manufacturing drugs to supply the world. That potential should be tapped for indigenous production of ART that will reduce the cost.
- Social and religious groups should be involved in raising awareness and effective implementation of the program in all communities.
- At the district level program management professionals are recruited in NRHM. Such provisions should be available for better utilization of funds keeping in mind the importance of prevention than cure.
- Rural communities should be reached for awareness generation and allocation of funds.
- Good NGOs are working in the areas so strategy should also be made to rehabilitate the PLHIV because of economic losses, poor quality healthcare, stigma and discrimination.

Threats

- Reduced budget allocation can seriously hamper the implementation.
- Withdrawal of international agencies could be hampering the progress.
- Some states in India have banned sex education due to religious and cultural sentiments which is a serious setback to the program.

Political Declaration adopted by United Nations Member States charts a course to end AIDS as a public health threat by 2030

On 10 June 2016, United Nations Member States have committed to implementing a bold agenda to end the AIDS epidemic by 2030 during the United Nations General Assembly High-Level Meeting on Ending AIDS, held in New York, United States of America, from 8 to 10 June. The progressive, new and actionable Political Declaration includes a set of specific, time-bound targets and actions that must be achieved by 2020 if the world is to get on the Fast-Track and end the AIDS epidemic by 2030 within the framework of the Sustainable Development Goals.

During the opening plenary, the United Nations Secretary-General, Ban Ki-moon, said that the AIDS response had been a "source of innovation and inspiration," and the Executive Director of UNAIDS outlined the progress made in recent years, with 17 million people accessing antiretroviral treatment and significant declines in AIDS-related deaths and new HIV-infections among children.

The five official panels were under the following themes:

1. AIDS within the Sustainable Development Goals: leveraging the end of AIDS for social transformation and sustainable development.
2. Financing and sustaining the end of AIDS: the window of opportunity.
3. Getting ahead of the looming treatment crisis: an action agenda for getting to 90–90–90.
4. Leaving no one behind: ending stigma and discrimination through social justice and inclusive societies.

5. Children, adolescent girls and young women: preventing new HIV infections.

Participants called for access to comprehensive sexuality education and harm reduction services as well as strengthening outreach to young women and adolescent girls and key populations, including men who have sex with men, sex workers, people who inject drugs, transgender people and prisoners as well as migrants.

The United States of America announced the launch of a new US$ 100 million Key Populations Investment Fund to increase access to HIV services for sex workers, gay men and other men who have sex with men, people who inject drugs, transgender people and prisoners. The new fund will focus on reducing stigma and discrimination, empowering community leadership in the design and delivery of services and increasing the quality of data on key populations.

Yusuf K. Hamied, Chair of the Indian pharmaceutical company CIPLA, announced a package of assistance to African countries to facilitate the local production of medicines in Africa.

Armenia, Belarus and Thailand joined Cuba in receiving official certificates of validation from the World Health Organization for eliminating new HIV infections among children. Thailand is the first country with a major HIV epidemic (450 000 people living with HIV in 2014) to receive such validation.

The Joint United Nations Programme on HIV/AIDS (UNAIDS) leads and inspires the world to achieve its shared vision of zero new HIV infections, zero discrimination and zero AIDS-related deaths. UNAIDS unites the efforts of 11 UN organizations—UNHCR, UNICEF, WFP, UNDP, UNFPA, UNODC, UN Women, ILO, UNESCO, WHO and the World Bank—and works closely with global and national partners towards ending the AIDS epidemic by 2030 as part of the Sustainable Development Goals.

References

ACOG Commiittee No. 417: Addressing Health Risks of Noncoital Sexual Activity. Obstet Gynecol. 2008;112:735-738

Aggarwal et al . Chemoprophylaxis after Occupational exposure to HIV. JIMSA 1998; 11:165-76.

AIDS Action. Religion and HIV/AIDS. AIDS action 2000; 47:4-5.

Altman L. Former Model of Sccuss - Thailand's AIDS Effort Falters, UN Report's New York Times, July 9 2004.

Anandhi S. Sex Education Conundrum. Economic and Political Weekly 2007; August 18: 3366-3368.

Avert Society. Acworth complex, RA, Kidwai Marg, Wadala, Mumbai 400031.

BBC. Warning on condom safety. Sunday, 7 July, 2002, 22:56 GMT 23:56 UK.

Bhat R, Saha S. Financing Issues in Providing Anti-Retroviral Drugs for HIV/AIDS treatment in India. Economic and Political Weekly 2005; April 16 1640-46.

Bhattarai MD. HIV/AIDS Control Needs a clear plan of action (Letter).Bul WHO 2001; 79 (4): 375.

BMJ. 'Can India avoid being devastated by HIV?' . BMJ; 2002, January 36.

Brahmam, G.N.V., Kodavalla, V., Rajkamur, H., et al. (2008). Sexual practices, HIV and sexually transmitted infections among self-identified men who have sex with men in four high HIV prevalence states of India. AIDS, 22(5), S45 - S57

Carey RF et al., "Effectiveness of Latex Condoms As a Barrier to Human Immunodeficiency Virus-sized Particles under the Conditions of Simulated Use," Sexually Transmitted Diseases, July/August 1992, vol. 19, no. 4, p. 230.

CDC (http://www.niaid.nih.gov/dmid/stds/condomreport.pdf; accessed on August 2007).

Chhabra R. National AIDS Control Programme: A Cretique. Economic and Political Weekly 2007;XLII (2): 103-108.

Choudhury U. 'UN warns India is sitting on AIDS bomb as 4,58 million already infected', Agence France Presse, July 28 (2003).

Christensen A.(2002)'Truckers carry dangerous cargo', Global Health Council, May 1

Davis KR and Weller SC. The effectiveness of condoms in reducing heterosexual transmission of HIV. Fam Plann Perspect 1999;31:272-279.

Deb S. et al. Hidden psychiatric morbidities and general health status among men who have sex with men and other clients of a sexually transmitted disease clinic of kolkata: A comparative study. Ind J Com Med 2010; 35 (1): 193-197.

Dutta et al.(2002) 'Strategizing peer pressure in enhancing after safer sex practices in brothel setting', Abstract TuPeF5332, The XIV International AIDS Conference.

Ekstrand M et al (2003) 'HIV/AIDS in India', AIDS Policy Research Center, University of California, August 2003, p.56.

Ghate MV, Paranjape RS. Chemoprophylaxis after Occupational Exposure to HIV. AIDS Research & Review 1999; 2 (3): 139-143.

Gomes LA, Somu G, rinkoo AV, Vinay GM. Utilization of Integrated Counseling and testing center (ICTC): A comparative study between a tertiary care teaching hospital and a government district hospital in Karnataka. Ind J Public Health 2007; 51 (1): 39-40.

Gomare et al. (2002) 'Adopting strategic approach for reaching out to inaccessible population viz' Abstract WePeF6707F abstract, The XIV International AIDS Conference.

Gopal Raj N. HIV Vaccine-a long way to go. The Hindu 2005; 10 February:10.

Govt. of India Country Scenarios 1999-2000, NACO. Min of H & F Welfare. GOI, 2001.

Govt. of India. NACO Annual Report. GOI 2011.
Govt. of India Simplified STI and RTI treatment guidelines. NACO, Ministry of H&FW, GOI, New Delhi, 1998.
Govt. of India. NACO Report 2004. NACO, Min of H & F Welfare.
Govt. of India. NACP IV. Ministry of Health & Family Welfare, New Delhi 2011.
Heffernan G. (2004) 'Housewives account for one fifth of India's HIV cases, expert says', India Post and NCM, April 16.
Hindustan Times. HIV infected blood triggers an outrage 2009.
Human Rights News 'AIDS in India: Money won't solve crisis, Rising violence against AIDS-affected people', November 13, 2002.
InfoChange (2003) 'HIV/AIDS in Manipur: the need to focus women', August.
Kaiser Network (2003) 'India Must act to prevent tens of millions of HIV cases, UNAIDS director says: 458 M Indians already HIV-positive', Daily HIV/AIDS Report, July 25
Kishore J, Sharma S, Ranjan R, Ingle GK. Awareness of HIV/AIDS & STDs among rural adolescents in Hatras District Uttar Pradesh. H&PPI 2006, 29 (4): 187-97.
Kootikuppala S.R. et al (1999) 'Sexual lifestyle of long distance lorry drivers in India: a questionnaire survey', British Medical Journal, January 16
Lancaster J. (2003) 'AIDS begins to widen its reach in India: Disease spreading beyond high-risk groups to general population;, Washington Post Foreign Service, June 11
Lancet (2003) 'Spreading the word about HIV/AIDS in India', Vol.361, May
Lawyers Collective HIV/AIDS Unit. 'Mandatory premarital testing', Newsletter 15, December (2002).
Lindberg L.D, Jones R, Santelli JS Noncoital Sexual Activities among adolescents. *Journal of Adolescent Health* 2008; 43 (3), p.231-238.
Lisam D.R. (2002) 'Translating knowledge and experience into policy change and action-success stories from Manipur, India', Abstract TuPeG5514, The XIV International AIDS Conference
Malavade J.A.B et al. 'Ethical and legal issues in HIV/AIDS counseling and testing', Abstract ThPeE7902, the XIV International AIDS Conference (2002).
Marseille E, Hoffmann PB, Kahn JG. HIV prevention before HAART in Sub-Saharan Africa. Lancet 2002; 359: 1851-6.
NACO (2003) 'HIV/AIDS Surveillance in India', www.avert.org/aidsindia.htm.
NACO (2003) 'HIV/AIDS Surveillance in India', www.naco.nic.in/indianscene/esthiv.htm.
Panda et al. (2001) 'Interface between drug use and sex work in Manipur', National Med J India, Jul-Aug; 14 (4): 209-11.
Panda S. et al. (2000) 'Transmission of HIV from injecting drug users to their wives in India', International Journal of STD and AIDS, July: 11 (7): 468-473.
Pandey A, Reddy D C S, Thomas M.What Lies Behind the Fall in the HIV Population in India? Commentary. Economic & Political Weekly 2008; December 27: 17.
Pandey A, et al BMJ Open 2012; 2: 1-8
Population Reference Bureau (2003) '2003 Data Sheet Highlights: Using Global Population Projections', Data Sheet
Reid G. and Costigan G. (2002) 'Revisiting 'the Hidden Epidemic': a situation assessment of drug use in Asia in the context of HIV/AIDS', The Center for Harm reduction, The Burnet Institute, Australia, January, p.81.
Roanld CM 1992. http://www.abortionfacts.com/learn/condoms.asp accessed on 6th July 2007.
Saravanamurthy, P., P. Rajendran, L. Ramakrishnan, G. Ashok, P.M. Miranda, S.S. Raghavan, V.S. Dorairaj, S. Sahu. STI and HIV prevalence in male-to-female transgender communities in Chennai, Southern India. International AIDS Conference, Mexico, 2008.
Setia, M.S., Lindan, C., Jerajani, H.R., Kumta, S., Ekstrand, M., Mathur, M., Gogate, A., Kavi, A.R., Anand, V., & Klausner, J.D., (2006). Men who have sex with men and transgenders in Mumbai, India: An emerging risk group for STIs and HIV. Indian Journal of Dermatalogy, Venereology & Leprology, 72(6), 425-431
Shafeeq M. (2003) 'Andra Pradesh's promiscuity alarms health workers', Indo-Asian News Service.
Shankaran S.S. (2002) 'Intervention for women and children in the red light area', Abstract WePeG6910, The XIV International AIDS Conference
Shevkani M et al. An overview of Post exposure prophylaxis for HIV in health care professionals: Gujarat Scenrio. Ind J Sexual Transmitted Diseases & AIDS 2011; 3 (1): 9-13.
Shinde S, Setia MS, Row-Kavi A, et al. Male sex workers: are we ignoring a risk group in Mumbai, India? Indian J Dermatol Venereol Leprol 2009;75(1):41-46
Sivaram S. (2002) 'Integrating income generation and AIDS prevention efforts: lessons from working with devadasi women in rural Karnataka, India', Abstract MoOrF1048, The XIV International AIDS Conference
Solomon S. and Ganesh A.K. 'HIV in India', International AIDS Society- USA, Vol. 10 Issue 3, July/August (2002).
TATA Inst Social Sciences. HIV/AIDS Prevention & Counseling: A Manual. CAIRAT 94.
Teixeira PR, Vitoria MA, Barcarola J. The Brazilian Experience in Providing Universal Assess to anti-retroviral therapy: International AIDS Economic Network. Economics of AIDS and access to HIV/AIDS care in Developing countries, Issues and Challenges 2003; Chapter 2.
Tripathy S, et al. Sentinel surveillance for HIV infection in Tuberculosis patients in India. Ind J Tuberculosis 2002; 49: 17-20.
UN. Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat. 'World population Prospects: the 2002 revision', Highlights, New York, February, 2003 p. 78-90.
UNAIDS (2001) 'Population Mobility and AIDS', Technical Update, February, p.5.
UNAIDS 2004 Report on the Global AIDS Epidemic. UNAIDS
UNDP. Thailand's Response to HIV/AIDS: Progress and Challenges 2004.
Underhill K, Montgomery P, Operario D. Sexual abstinence only programmes to prevent HIV infection in high income countries: systematic review. BMJ, 26 July 2007.
USAID. 'HIV/AIDS Country Profile India', March 2003.
Weller S, Davis K. Condom effectiveness in reducing heterosexual HIV transmission (Cochrane Review). In: The Cochrane Library, Issue 2, 2004. Chichester, UK, John Wiley & Sons, Ltd.
World Bank 'South Asia Region (SAR)- India' Regional Updates.

CHAPTER 11

NATIONAL VECTOR BORNE DISEASE CONTROL PROGRAM

The Directorate of National Vector Borne Disease Control (NVBDC) Program is the national nodal agency for prevention and control of major vector borne diseases of public health importance namely Malaria, Filaria, Japanese encephalitis (JE), Kala Azar and Dengue. Chikungunya fever, has reemerged as an epidemic after more than three decades, also added to this list of vector borne diseases. This program is now come under the umbrella of National Rural Health Mission (NRHM).

Vector borne diseases are complex; their presence depends on the interaction of numerous biological, ecological, social and economical factors. Their interplay determine the intensity of diseases transmission; who is infected; who gets sick; and who will die. The National Vector Borne Disease Control Program (NVBDCP) is one of the most comprehensive and multifaceted public health activities in the country and concerned with prevention and control of vector borne diseases. The preventive and control of these vectors include environmental management and chemical methods. Proper solid waste disposal and improved water storage practices prevent breeding of mosquitoes.

Out of the various vector borne diseases, malaria, filariasis, dengue, chikungunya, and JE are transmitted by different kinds of mosquitoes, while kala-azar by sand flies. Mosquito density is directly associated with the water collections. Human activities, such as urbanization, industrialization and construction projects as well as indiscriminate disposal of containers, tyres, junk materials, cups, etc., often create mosquitogenic environment and thus spread vector borne diseases. The sandflies-the kala-azar vector, breed in shady, damp and warm places, found under stones, in cracks and holes in the soft soil, in masonry and rubble heaps, in hallow trees and rodent burrows, bases of shallow wells and embankments. Therefore, proper sanitation and hygiene practices are critical to prevent sand fly breeding. These sanitary practices should be encouraged through community based programs. However, the states are responsible for planning, implementation monitoring of vector borne disease, prevention, control program but involvement of community at each step is considered to be vital for its success.

Factors increase the risk of vector borne disease outbreaks

- ✓ Increasing urban population
- ✓ Shortage of water supply
- ✓ Traditional water storage
- ✓ Poor garbage collection
- ✓ Changing life style (e.g., use of water coolers, not using mosquitoe net, tourism, etc.)
- ✓ Rapid transportation
- ✓ Lack of surveillance of clinical cases
- ✓ Lack of laboratory facilities for diagnosis.

✓ Lack of professional manpower such as epidemiologist, entomologists, etc.

PROGRAM

Vision: A well informed and self-sustained, healthy India free from vector borne diseases with equitable access to quality health care.

Mission: An integrated and accelerated action towards reducing mortality on account of malaria, dengue and Japanese encephalitis by half and elimination of kala-azar by 2010 and elimination of lymphatic filariasis by 2015.

Considering the *Millennium Development Goal* 6 the country wants to combat HIV/AIDS, malaria and other diseases; and its Target 6 that is to halt and begin to reverse the incidence of malaria and other major diseases, it is decided that the existing activities for prevention and control of malaria and other vector borne diseases as in X plan would be continued in XI plan period with appropriate added activities. The approaches initiated under Enhanced Malaria Control Project with World Bank assistance would be sustained through the support of domestic budget and supplemented with GFATM and World Bank assisted Enhanced Vector Borne Disease Control Program (VBDCP). To consolidate the efforts for realizing National Health Policy (NHP) goals, the Govt. of India has launched National Rural Health Mission in April 2005.

Objectives

Reduce malaria morbidity and mortality by 50% by 2012 (Base line year is taken 2006).

Targets

- Annual Blood Examination Rate (ABER) over 10 per cent.
- Annual Parasite incidence (API) 1.3 or less
- 25% Reduction in morbidity and mortality due to malaria by 2010 and 50% by 2012.

Indicators

- Percentage of blood smears examined from population under surveillance during the year.
- Number of laboratory confirmed malaria cases per 1000 population (API).
- Number of malaria deaths per 100,000 population.

Strategies

The basic approach for vector borne disease control involves a strategy directed against the parasite and vector, and to enlist involvement of community in practicing various preventive measures. Based on this concept following major strategy is proposed to be adopted under the National Vector Borne Disease Control Program:

1. *Disease management*
   - Early case detection and complete treatment
   - Strengthening of referral services.
   - Epidemic preparedness and rapid response
2. *Insecticide Resistance in Vector:* More research will be supported to understand the causes of resistance and its management.
3. *Legislative Measures:* Civics bye-laws and building bye-laws enforment.
4. *Involvement of NGOs/Private Sector/ Community/Local self government*
5. *Quality Assurance on Laboratory Diagnosis*
6. *Long Lasting Insecticide Treated Bednets:* usually bed nets are to be treated with insecticide twice in a year to increase the effectiveness of bed nets. This is a labor intensive and operationally challenging task, therefore, during the XI plan, long lasting insecticide treated nets (LLINs) having efficacy of 3-5 years had been be introduced after successful field trials.
7. *Improve efficiency and quality of services* at primary, secondary and tertiary levels.

Primary level

- ASHA under NRHM, Aganwadi Workers of ICDS and Community Volunteers of NGOs would also be trained to serve Fever Treatment Depots (FTDs).
- The PHCs and CHCs would be equipped to provide in patient facility for management of PF malaria cases.
- Laboratory surveillance from private sector would be enhanced by coordination with private practitioner and private laboratories.

Secondary level

- Training of medical officers, lab, technicians and community volunteers of public and private sector.
- District level hospitals would be equipped with ventilators and appropriate laboratories services.
- Medical audit to measure the effectiveness of the program.

Tertiary level

- The Medical College hospital will manage all referral cases.
- Undertake operational on use of effectiveness of rapid diagnostic kits. Efficacy of combi-pack and therapeutic efficacy studies
- Renal diagnosis for management of severe malaria cases.

8. *Environmental Management*

Due considerations need to be given for choosing appropriate location of human settlements, for water supply system, urban waste water supply system, sullage disposal, road and railway track construction as well as in the brick kilns, stone quarries, zoos and in water resource developmental project.

Settlement location should be free from undulations with a gentle slope down to a running stream, beyond the flight range of mosquitoes. The pre-existing water bodies should be treated, while the coastal townships should be protected by constructing dikes and embankments.

Hydraulic engineering which is an important components of environmental management focuses on relevant activities such as draining, stream canalizing, lining of streams and canals, land leveling and filling to eliminate depression areas, seepage control, piped or covered canals and drains, weed control, improved water management, diking and dewatering, and strict discipline in the use of water. Sluicing and slushing of stream water by self-initiating and self terminating siphon system can be arranged (WHO 1980).

Wells, tube wells and hand pumps should have a platform sloping towards the peripheral, which should lead to the drainage system or to a soakage pit with the vertical drainage system (Govt. of India 1996). Waste water disposal system need to be maintained by reducing the roughness of the canal as well as by increasing the hydraulic radius and gradients so that adequate self-cleaning velocity remain persisted. Canal should be underground or covered. Regular cleaning and removal of silt accumulation should be carried out. The water from the canal should be released weekly rather than monthly to command areas for regular flushing.

Mosquito control during construction is important. A proper gradient can be maintain by cutting and filling of the land. Excavation for earth filling should be kept to a minimum, of a reasonable size and at a distance from the proposed housing sites. Overflow water from curing of walls, should be drained, whereas gunny bags should be used for curing of horizontal components.

Road and railways construction: special precautions should be taken during construction. Regular inspection and cleaning of all open and underground drains, near railways tracks should be mandatory by provision of adequate sanitation staff. Suitable drainage system and treatment facility in labor colonies should be provided to eliminate cesspool near tracks. All brick manufacturing factories and quarries should be governed by the Water and Air pollution Control Acts and be licensed. The site should be at least 3 kms from the nearest dwelling in the area and should have a natural drainage towards a nearby valley or river or lake. Moats around zoos, picnic spots and historical buildings should be filled with the city solid through controlled tipping and should be cleaned of all vegetation and lined. The city drainage and sewage should not be discharged in the moat.

9. *Monitoring and Evaluation*

- The sentinel sites for capturing date on severe and complicated and the drug resistance would be activated through the web based National Anti-Malaria MIS (NAMMIS). Efforts would be made for integrating with integrated disease surveillance project.
- Field reviews/visits on regular basis by the personnel from state/district level and ICMR institutes would be made.

10. *Collaboration with National Institute of Malaria Research (NIMAR) and Medical Colleges*

- NVBDCP will collaborate with ICMR institutions viz. NIMR and Medical Colleges of the states for efficient monitoring supervision, training drug policy and research in prevention and control of malaria.

11. *Inter-Sectoral Convergence*

Inter-sectoral collaboration has been scaled up at all levels of implementation of prevention and

control of malaria and other vector borne disease. Public Private Partnership (PPP) building has been intensified for involvement of NGOs/ Faith Based Organizations/Community Based Organizations/ Local self-government (PRIs), Non-Health Sector Departments (Tribal Welfare, Rural Development, Agriculture, Social Welfare, Education, Railway, CRPE, BSF, Armed Forces, etc.) as well as corporate sector, Tea Estates/ Tea Association for delivery of services in areas with problems of accessibility and where inadequate public health care delivery system existed. Guidelines on public private partnership have been development with following schemes:

(A) Early diagnosis and prompt treatment (EDPT)-

a. Scheme 1: Provision of outreach services- Drug Distribution Center (DDC) Fever Treatment Depot (FTD),

b. Scheme 2: Provision of microscopy and treatment services,

c. Scheme 3: Hospital based treatment and care of service and complicated malaria cases;

(B) Integrated vector control:

a. Scheme 4: Promotion of insecticide bed nets, insecticide treatment of community owned bed nets and distribution of insecticide treated bed nets in selected areas,

b. Scheme 5: Promotion of larvivorous fish,

c. Scheme 6: Indoor Residual Spraying (IRS) have been disseminated to states and hosted website.

12. *Behavior Change Communication activities for Social Mobilization:* Extensive social mobilization has been initiated through structured Behavior Change Communication (BCC) campaign targeting care takers and care providers, political/opinion leaders/ planners giver/media for prevention and control of vector borne disease. The objectives of the BCC campaign are: i) promoting attitudinal and value change among target audiences leading to informed decision, modified behavior, desirable practices, ii) building support for the program across inter-sectoral partner organizations, influential sectors of society and health care services providers and eliciting commitment for action, iii) stimulating increased and sustained demand for quality prevention and care services, iv) ensuring availability of services, v) improving quality of life and social and economic conditions.

During the 10th five year plan the program focussed on: Training of health personnel; Improving reporting, recording and monitoring of diseases; Monitoring drug and insecticide resistance; Using standardized protocol for the diagnosis and management; Involvement of Panchayati Raj Institutions; Improvement in IEC; Involvement of NGOs and private sector; Encouraging pharmaceutical industry; manufacturers of insecticides and bednets; social marketing; Evaluate community acceptance of insecticide treated bednets and curtains; Research studies on vector bionomics and behavior, bioenvironmental control, screening and development of new antimalarial drugs especially herbal products, evaluate new drugs and insecticides; health impact assessment; Cost effectiveness of the use of remote sensing.

Directorate of National Vectorbone Disease National Center For Disease Control

The National Institute of Communicable Disease (NICD) has been renamed as the National Center for Disease Control (NCDC) which was inaugurated on 26th July 2009.

11A. MALARIA

Malaria is one of the major communicable diseases affecting humankind, caused by Plasmodium parasite, transmitted by the bite of infective female Anopheles mosquito. There are four plasmodium species important to mankind, *P vivax (Pv), P falciparum (Pf), P malariae (Pm) and P ovale (Po).*

Malaria has been a major public health problem in India. Intermittent fever, with high incidence during the rainy season, coinciding with agriculture, sowing and harvesting, was first recognized by Romans and Greeks who associated it with swampy areas. They postulated that intermittent fevers were due to the 'bad odour' coming from the marshy areas and thus gave the name 'malaria' ('mal'=bad + 'air') to intermittent

fevers. In spite of the fact that today the causative organism is known, the name has stuck to this disease. Ronald Ross described the life cycle of Plasmodium in mosquitoes responsible for malaria in human. Loveran discovered the parasiti.

EPIDEMIOLOGY

There are about 100 countries or territories in the world considered as malarious and more than 2400 million of the world's population are still at risk. Recent estimates indicate that there are approximately 300-500 million clinical cases and between 1.5 – 3 million deaths occur every year due to malaria worldwide (most of the 3,000 deaths each day - 10 every second - are in Africa), 90% of which occur in tropical Africa, south of the Sahara, mostly caused by *P falciparum (Pf)* (Berman et al 2004, WHO 2000). In terms of malaria control and human health, chloroquine was the most important antimalarial for more than 40 years because of its efficacy, safety, and affordability (Baird 2005, White 1996). Resistance of P. falciparum to chloroquine is now common in practically all malaria endemic countries of Africa (Trape 2001). Resistance to Sulfadoxine/pyrimethamine is widespread in Southeast Asia and South America. Mefloquine resistance is also observed in the border areas of Thailand, Cambodia and Myanmar. Resistance of P. vivax to chloroquine has now been reported from Indonesia, Myanmar, Papua New Guinea and Vanuatu.

Burden of malaria is increasing due to drug and insecticide resistance, urbanization with increasing construction sites, military conflicts, wars, civil unrest, along with unfavorable ecological changes. These factors have significantly contributed to the malaria epidemics in vulnerable populations and areas. Another disquieting factor is the reemergence of malaria in areas where it had been eradicated (e.g. Korea, and Tadjikistan) or its increase in countries where it was nearly eradicated e.g. Azerbaijan, northern Iraq and Turkey (Krogstad 1996).

In India, there are approximately 1.8 million positive cases reported annually. The epidemiological situation of malaria is given in table 11A.1. *P vivax* is the commonest (60-70%) followed by *Pf* (30-45%), *P. malariae* species is rarely found and *P. Ovale* is not reported in India. In some areas such as Army units in Assam the P falciparum is as high as 98% of the total cases (Pardal et al 2009). *P falciparum* is predominant parasite species in the malaria-ridden tea estates and Army units of Assam and in Orissa (Pardal et al 2009, Dev 2006, Patra et al 2004). *P. falciparum* causes malignant variety of malaria because around 0.5% to 2% may develop complicated malaria, of which upto 50% are fatal, if timely treatment is not commenced. Infection with *P.falciparum* is the most deadly form of malaria however, vivax is equally dangerous (Tjitra et al 2008; Genton et al 2008). In *P. falciparum*, cerebral malaria is primarily attributed to sequestration of infected erythrocytes in cerebral vessels.

Table 11A.1: Epidemiological situation of malaria in India

Year	Malaria In Million	Pf in million	API	Death Numbers
1951	75.0	-	-	-
1961	0.04	-	-	-
1991	2.11	0.92	-	-
1996	3.04	1.18	3.48	1010
1997	2.66	1.04	2.86	879
1998	2.22	1.03	2.44	664
1999	2.28	1.14	2.41	1048
2000	2.03	1.05	2.04	972
2001	2.05	1.01	2.06	1005
2002	1.84	0.90	1.82	973
2003	1.87	0.86	1.82	1006
2004	1.92	0.89	1.84	943
2005	1.81	0.80	1.68	963
2006	1.79	0.84	1.66	1708
2007	1.50	0.74	1.39	1311
2008	1.53	0.78	1.36	1054
2009	1.25	0.64	-	1144
2010	1.10	0.58	-	1018
2011	1.31	0.66	1.10	754
2012	1.06	0.53	0.85	519
2013	0.88	0.46	0.72	440
2014	1.10	0.72	0.89	562
2015	1.12	0.75	0.89	286

Economic Concerns

The estimates of labor days loss due to malaria amount to 1328.75 million man-days per year. The total expenditure incurred on morbidity due to malaria is Rs. 7.18 per capita per annum (Sharma 1996). The annual economic loss due to malaria is approximately Rs. 10 270 million if Rs. 10 per capita annual expenditure is taken into account (1027 million

population, Census of India 2001 X Rs.10). Cost of preventive measures such as insecticide treated bednets was found to be US $ 219-829 per death averted in Gambia (Picard 1993; Graves 1998); chemoprophylaxis for children was costed US $ 167 per death averted (Picard 1992); and antenatal chloroquine chemoprophylaxis costed US $ 950 per death averted (Schultz 1995). Combined prevention and treatment program costed US $ 2596 per death averted in Brazil (Akhavan 1999). Although some of the programs are cost effective but universal application of chemoprophylaxis may be associated with drug or insecticide resistance, complications, etc., and need to be considered before implementation in any community.

Mode of transmission

Malaria is transmitted to man by the bite of an infected mosquito. The male mosquito lives on plant juices and not blood. Therefore, only the female Anopheles mosquitoes transmit malaria. The mosquito is characterized by wings with dark spots and sits at an angle with resting surface, and breeds in clean water. Female mosquito usually bites every 3rd day to suck blood so that it can develop and lay eggs. It takes 10-14 days for development of malaria parasite in mosquito. At the end of this period mosquito becomes capable of infecting the man by biting to take blood meal. When infective mosquito bites another person, it introduces parasite in healthy person; and person will develop signs and symptoms of malaria after 7-12 days of bite. Man and mosquito cycle of malaria is given in figure 11A.1.

Vectors of Malaria

- There are many vectors of malaria
- *Anopheles culicifacies* is the main vector of malaria in rural areas and Anopheles stephensi in urban areas.
- It is a small to medium sized mosquito with *Culex* like sitting posture

1. Feeding habits

- It is a zoophilic species
- When high densities build up relatively large numbers feed on people.

2. Resting habits

- Rests during daytime in human dwellings and cattlesheds

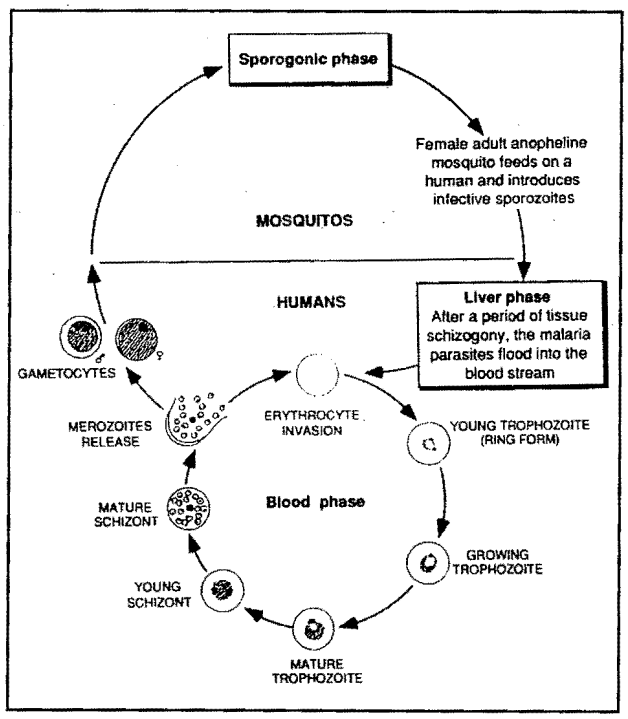


Figure 11A.1: Plasmodium cycle in Mosquito and Man

3. Breeding places

- Breeds in rainwater pools and puddles, borrowpits, river bed pools, irrigation channels, seepages, rice fields, wells, pond margins, sluggish streams with sandy margins.
- Extensive breeding is generally encountered following monsoon rains.

4. Biting time

- Biting time of each vector species is determined by its generic character, but can be readily influenced by environmental conditions.
- Most of the vectors, including *Anopheles culicifacies,* start biting soon after dusk. Therefore, biting starts much earlier in winter than in summer but the peak time varies from species to species.

CLINICAL PRESENTATION

Typical: Sudden onset of high fever with rigors and sensation of extreme cold followed by feeling of burning heat, leading to profuse sweating and remission of fever by crisis thereafter. The febrile paroxysms occur every alternate day. Headache, bodyache, nausea, etc. may be associated features.

Atypical: In atypical cases, classical presentation as mentioned above may not manifest. Hence, any fever case without any other obvious cause in the endemic areas during transmission season may be considered as malaria. For ruling out other obvious causes of fever, the following should be looked for:

1. Cough and other signs of respiratory infection
2. Running nose and other signs of cold
3. Diarrhoea
4. Pelvic inflammation indicated by severe low backache, with or without vaginal discharge and urinary symptoms
5. Skin rash suggestive of eruptive illness
6. Burning micturition
7. Skin infections e.g. boils, abscesses, infected wounds
8. Painful swelling of joints
9. Lymphadenopathy
10. Ear discharge

However, none of these symptoms exclude malaria with certainty therefore a trained clinician has to judge and ensure whether they constitute another obvious cause.

Symptoms of severe and complicated malaria

The main symptom is high-grade fever, which is associated with at least one of the following:

- Prostration (inability to sit), altered consciousness lethargy or coma
- Breathing difficulties
- Severe anaemia
- Generalized convulsions/fits
- Inability to drink/vomiting
- Dark and/or limited production of urine

Patients with prostration and/or breathing difficulties should, if at all possible, be treated with parenteral antimalarials and antibiotics. Oral treatment should be substituted as soon as reliably possible. Frequent monitoring of laboratory parameters is essential – blood sugar, blood urine, fluid balance, associated infection, etc. Drugs that increase gastro intestinal bleeding should be avoided. The priority requirement is the early recognition of signs and symptoms of severe malaria that should lead to prompt emergency care of patient.

Signs of severe and complicated malaria

- Cerebral malaria, defined as unarousable coma not attributable to any other cause in a patient with falciparum malaria.
- Generalized convulsions.
- Normocytic anaemia.
- Renal failure
- Hypoglycaemia.
- Fluid, electrolyte and acid-base disturbances
- Pulmonary edema
- Circulatory collapse and shock ("algid malaria").
- Spontaneous bleeding (disseminated intravascular coagulation).
- Hyperpyrexia
- Hyperparasitaemia
- Malarial haemoglobinuria.

Such cases require immediate attention. Due to the heavy burden of disease in India, and fever is the cardinal symptom of malaria. Every fever case is presumed to be malaria according to the program.

Children: The signs and symptoms in children are a history of high fever, plus at least one of the following:-

(i) prostration (inability to sit), altered consciousness lethargy or coma;
(ii) breathing difficulties;
(iii) severe anemia;
(iv) convulsions;
(v) inability to drink/ vomiting

Patients with prostration and/or breathing difficulties should, if at all possible, be treated with parenteral antimalarials and antibiotics. If the clinical condition permits, other patients may be treated with oral antimalarials.

Diagnosis

Clinical: Health professional can make diagnosis on the basis of clinical findings.

Blood Film: It is always confirmed by blood smear examination. The Fever Treatment Depot (FTD) holder, malaria worker, and NGOs worker (as well as Malaria Link Volunteer) should collect the thick and thin blood smears at the place of their residence/work. The best time to prepare a blood film is soon after a rigor. Blood slides are examined under the microscope after Giemsa staining or Leishman's staining.

Sternal or liver puncture: Malarial parasites often be seen in sternal fluid and liver puncture smear which can be performed in medical ward or diagnostic laboratory.

Serological Tests: Liver function tests are abnormal in malaria; SGOT and SGPT are raised; cephalin flocculation tests become positive; and fasting glucose level decreased.

Rapid Test: For rapid diagnosis in case of falciparum **Dipstick Test** (A Rapid Whole Blood Immuno-Chromatographic Test) can be performed. This test is based on detection of circulating Plasmodium Histidine-Rich Protein particularly *falciparum* in whole blood. The test uses two antibodies specific for Pf histidine-Rich Protein 2 antigen. One of the antibodies is attached to visible colloidal gold and impregnated into a sample pad, while the second antibody is immobilized as a line across the test strip. Approximately 10 microgram of whole blood is added to the sample pad where lysis occurs and Pf HRP-2 antigen, if present, binds to the sample pad blood and labelled antibody migrate up the test strip crossing the second antibody line. In a positive sample, Pf HRP-2 complexed with the Gold-labelled antibody is captured by the antibody on the membrane and a pink line forms. In a negative sample, no pink line forms. The specificity and negative predictive value of this test is 99%. The only limitation of the test is that of PfHRP II antigen may persist in the blood for upto 2 weeks after parasite clearance. This enhances the chance of getting more false positive results by the test. But, this should not affect the course of treatment in a suspected case of malaria fever in an endemic areas. The test card available in market that can give the results in 3-5 minutes.

HISTORY OF MALARIA CONTROL IN INDIA

In the history of malaria control following milestones are established:

1.	Sir Bhore Committee Report	1946
2.	National Malaria Control Program	1953
3.	National Malaria Eradication Program	1958
4.	Urban Malaria Scheme	1971
5.	Modified Plan of Operation (MPO)	1977
6.	Malaria Action Program	1995
7.	Enhanced Malaria Control Program	1997
8.	National Anti Malaria Program	1999
9.	National Health Policy	2002
10.	National Vector Borne Dis. Cont Program	2004
11.	Intensified Malaria Control Project	2005
12.	National Rural Health Mission	2005

1. BHORE COMMITTEE: At the time of Independence of India malaria was contributing 75 million cases with 0.8 million deaths reported and was one of the serious public health problems. A countrywide comprehensive program to control malaria was recommended in 1946 by the Bhore Committee report that was endorsed by the Planning Commission in 1951. The national program against malaria has a long history since that time.

2. NATIONAL MALARIA CONTROL PROGRAM

In April 1953, Government of India, launched a National Malaria Control Program (NMCP) with the following *objectives*:

- To bring down malaria transmission to a level at which it would cease to be a major public health problem; and
- Thereafter an achievement was to be maintained by each state to hold down the malaria transmission at low level indefinitely.

Strategies under NMCP were:

1. The principal operational activities under the control program comprised of residual insecticide spray of human dwellings and cattle sheds;
2. Malaria control teams were organized and directed by the state anti-malaria organization to carry out surveys and to monitor the malaria incidence in the control areas; and
3. Antimalarial drugs were made available for patients reporting to an Institution.

Good results were obtained from India. Number of malarial cases and deaths had decreased significantly. Similar results were observed in many other parts of the world.

3. NATIONAL MALARIA ERADICATION PROGRAM (NMEP)

Experts from the world over recommended in 8th World Health Assembly held in 1955 to change in concept from control to eradication of malaria that resulted in launching of the National Malaria Eradication Program (NMEP) in 1958 with the objective to eradicate the malaria in 7-9 years. There

was a spectacular reduction in cases and nil death was reported in 1965. Thereafter the program suffered setbacks due to various constraints mainly financial, logistic, administrative and technical in nathse. This resulted in the resurgence of malaria during the 1970's. It was realized that urban areas have not received special attention in the program that could be one of the reasons of resurgence of malaria in the country.

4. URBAN MALARIA SCHEME: The proposal of urban malaria scheme (UMS) was sanctioned in 1971 when it was realized that urban malaria was a significant problem and if effective anti-larval measures were not undertaken in urban areas, the proliferation of malaria cases from urban to rural might occur in a bigger way. In spite of Urban Malaria Scheme operation by 1976, there were very high number of cases recorded. The strategy was further strengthened and launched Modified Plan of Operation. Detail of this scheme in given in this chapter.

5. MODIFIED PLAN OF OPERATION (MPO): In 1977 attempts at malaria eradication were given up and under the review policy, a Modified Plan of Operation (MPO) was adopted.

Objectives

- Elimination of malarial deaths,
- Reduction of malaria morbidity,
- Maintenance of the gains achieved so far by reducing transmission of malaria.

Areas were divided on the basis of API into two groups and separate **strategies** were suggested accordingly:

API 2 and above

1. *Insecticide spray*
2. *Entomological studies*
3. *Malaria Surveillance*
4. *Treatment of cases*
5. Attempts were made to intensify the efforts in rural areas with the assistance of the Swedish International Development Agency (SIDA) by providing input under *P falciparum (Pf)* Containment Program;
6. Decentralization of Laboratory services to the PHC level; and
7. Establishment of Drug Distribution Center (DDCs)/Fever Treatment Depots (FTDs).

API less than 2

1. Focal spray of insecticide with DDT (BHC or Malathion) if a case of Pf occur in the area.
2. Surveillance and treatment: active and passive surveillance should be carried out and presumptive treatment is given to all the fever suspected cases.
3. Ensuring Radical Treatment to those patients who are found positives in their blood smear
4. Epidemiological investigation of a malaria case to determine the causative factors.

The Modified Plan of Operation (MPO) was able to control the malaria deaths at lower level but 1994 onward, resurgence of malaria was observed in some states with epidemics and increase in mortality. These outbreaks were reported from Rajasthan, Manipur and Nagaland, Assam, Maharashtra and West Bengal and Haryana. An expert committee was constituted to review the situation and that described the criteria to identify "high risk areas" in the rural segment of the country and identified twenty worst affected cities/ towns contributing even 80% of urban malaria problem. The problem was due to the following reasons: rapid urbanization leading to lot of construction sites, dams, canals, which were favorable for mosquitoes to breed and there was no control measures. The current position of malaria in urban areas is given in Figure 11A.2.

6. MALARIA ACTION PROGRAM: Based on the recommendations, guidelines for the malaria control known as ***"Malaria Action Program"***, were formulated. Malaria control was made 100% centrally sponsored scheme since December 1994 for the seven Northeastern states and states like Andhra Pradesh, Bihar, Gujarat, Maharashtra, Orissa, and Rajasthan.

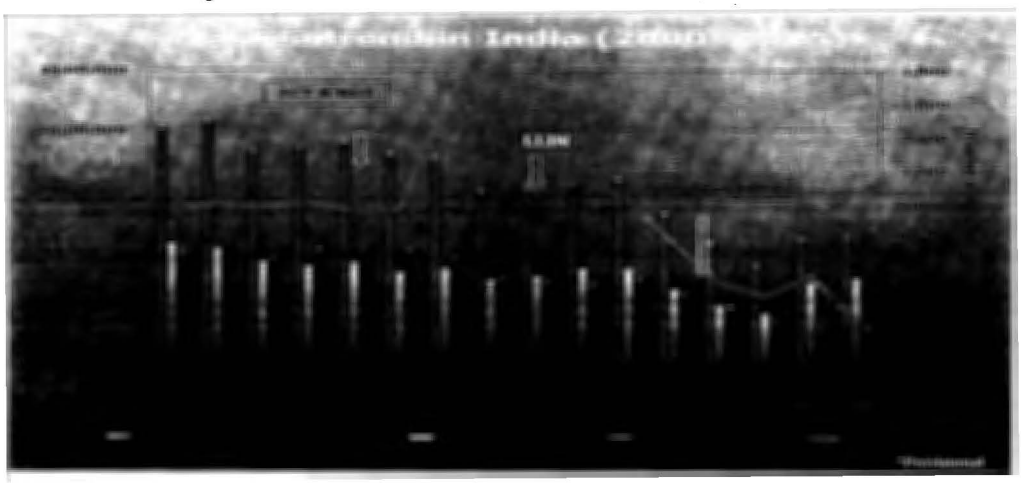
The expert committee had also identified epidemiological parameters for high risk areas. Following areas were identified:

Problem Area

A. Hardcore areas (Tribal Areas): Those areas where malaria control operations over the last four decades have failed to contain the disease. These were as follows:

1. Difficult terrain areas,
2. Predominantly having tribal population,
3. Predominantly having *P. falciparum (Pf)*,
4. Have stable malaria with transmission period extending up to 9 months or more, and

Figure : 11A.2 Trends of malaria cases and death in India



5. Predominantly have more deaths due to malaria in the country.

B. Epidemic Prone Areas: The periodic fulminating malaria epidemics has contributed a large number of malaria deaths, e.g. North-Western plains, semi-acrid climate zone with annual rainfall up to 100 mm and Indo-Gangetic plain.

C. Project Areas: The development of projects has caused: (a) attraction of poor, from infected areas or non-immune population of laborer to the endemic areas, (b) prolific increase in vector breeding places, and (c) increased man-mosquito contact.

D. Triple Insecticide Resistant Areas: *Anopheles culcifacies* has become resistant to the conventional insecticides, e.g. DDT, BHC, and malathion, in some part of the country, for example Northern parts of Maharashtra, Karnataka, and southern parts of Gujarat.

E. Urban Areas: In a view of Urban malaria scheme, it was detected that 15 cities are accountable for nearly 80% of *Pf* malaria cases.

Revised Control Strategy under the Malaria Action Program

1. **Tribal Areas:** All the 7 North-Eastern States and tribal areas of AP, Bihar, MP, Maharashtra, Orissa and Rajasthan where the important vectors are *An. minimus, An fluviatilis, An culcifacies* and *An dirus*.

   Disease management

   i) IEC and intensified IEC;
   ii) Case detection and presumptive treatment of fever through DDC/FTD/ACD/PCD, blood collection, slide collection and examination, and radical treatment with priority to Pf cases within 48 hours;
   iii) Multipurpose workers (MPW) should be able to identify severe cases of malaria requiring referral to PHC;
   iv) PHC should be well equipped to tackle all severe cases of malaria; and
   v) Alternative drug in chloroquine resistant Pf areas.

   Action required

   a) Link worker: one for 2000 population. He should also work as FTD and carry all blood slides of his area to PHC or malaria clinic twice a week. He should also bring drugs and microslides for FTDs in his area; and
   b) Other actions same as for epidemic prone areas.

2. **Epidemic Prone Areas:** Punjab, Haryana, Western UP, Rajasthan, MP, and a few pockets of other states where main vector is *An. culcifacies*, but *An. stephensi* is also present in some pockets.

   Disease Management

   i) Case detection and presumptive treatment of fever through Drug Distribution Center (DDC)/ Fever Treatment Depot (FTD), Active Case detection (ACD) /Passive Case Detection (PCD);
   ii) Blood slide collection and examination;
   iii) Radical treatment with priority to Pf cases within 48 hours.

3. **Project Areas**

   Disease Management

   i) Mass screening of labor /incoming population

should be continuously done if transmigration is frequent;

ii) All incoming persons from high risk tribals should be given presumptive treatment along with a single dose of 45 mg Primaquine; and

iii) Alternative drug in chloroquine resistant of *Pf* areas.

4. Urban Areas

Disease management

i) Active surveillance in slum areas at weekly interval;

ii) Activated passive surveillance in hospitals and dispensaries by providing extra worker to man a malaria post;

iii) Presumptive treatment; and

iv) Redical treatment with priority to *Pf* cases.

Action required

a) Provide adequate staff for active surveillance in slum areas and one worker for 20,000 population;

b) Establish one malaria clinic for 50,000 population; and

c) The location of malaria clinic should be preferably adjoining slum area if possible and wherever feasible its location should be in existing dispensary.

7. ENHANCED MALARIA CONTROL PROJECT:

The centeral government sought external support from World Bank to combat the malaria problem in the country. In 1997, World Bank sanctioned the Enhanced Malaria Control Project to strengthen the anti-malaria action in most affected areas. This has directly benefitted the six crore tribal population of the 8 peninsular states covering 100 districts and 19 urban areas. However, the population living in other malaria endemic areas has also benefited, as the strengthening of the components of IEC, training and Management Information System (MIS) have covered the entire country.

Selection of PHCs is based on:

i) Annual Parasitic Incidence (API) is more than 2 for last 3 years;

ii) Pf cases are more than 30% of the malaria cases;

iii) 25% population of the PHC in tribal; and

iv) The area has been reporting deaths due to malaria and also has the flexibility to direct resources to any needy areas in case of outbreak of malaria.

Objectives of EMCP

- Effective control of malaria to bring reduction in malaria morbidity;
- Prevention of death due to malaria; and
- Consolidation of the gain achieved so far.

Strategies

1. Early case detection and prompt treatment;
2. Vector control by indoor residual insecticide spray in rural areas with API of 2 per 1000 and above in the preceding three years with appropriate insecticide and by recurrent anti-malaria in urban areas;
3. Health education and community participation.

Components of EMCP

1. ***Early Case Detection and Prompt Treatment:*** the equipments and staff provision with their functions for early detection and prompt treatment are as follows:
   - A link worker in high Pf areas for a population of 2000 is appointed by Panchayat and paid Rs. 500 per month. He/she collects blood smears, provides presumptive treatment and forwards slides to PHC.
   - One microscope for every 30,000 population at PHC in rural areas and for 50,000 in urban areas.
   - ***Dipstick test*** in selected areas.
   - 1 Fever Treatment Depot (FTD) for every village.
   - Existing Multipurpose Workers (MPWs) and ANM are continued to function as doing previously.
   - Adequate quantities of drugs are made available. Newer medicines like Artemisinine derivatives have also been introduced in the program for the management of severe and complicated malaria cases.
   - Involvement of private sectors in case detection and treatment.
2. ***Selective Vector Control***

A. *Bio-Environmental Methods*

- Introduction of Larvivorous fishes: Currently 1193 district level and 63644 block /PHC level hatcheries have been established in the states.
- Use of Biocides-Bacillus thuringiensis H-14 (Bt) in selected urban areas.
- Environmental management methods.

B. *Selective spray*
   - Village in which there is one case of *Pf* or more qualify for residual spray in project area. Alternative new generation safer insecticides like synthetic pyrethroids are also applied.

3. ***Legislative Measures***
   Byelaws for control of mosquitoes (as in Delhi and Bombay Municipal Corporation Acts) would be extended to cover the whole country which enforced to bring changes in structural design of building to prevent mosquitoes.

4. ***Personal Protective Measures***
   Bednet Program is cost effective as compare to residual spray. Social marketing strategy were accepted at national level involving local NGOs for bednet use. Ecofriendly methods like introduction of Medicated Mosquito Nets (MMNs) are the part of this Program

5. ***Epidemic Planning and Rapid Response and Intersectoral Coordination***
   The project also facilitates capacity building for epidemic preparedness and response as well as manpower development at various levels of program implementation. Sector like agriculture, environment, education, and so on are sensitized to the malaria problem and the steps are taken for its prevention.

6. ***Institutional and Management Capacities Strengthening***
   Training and strengthening of Management Information System (MIS) and IEC is required in the country.

7. ***Operation Research***
   - Health seeking behavior especially of malaria patients.
   - Economic analysis of various interventions.
   - Alternative drug regimens and introduction of new drugs like Artesunate.
   - Evaluation of bednets and curtains.
   - Trial with biolarvicidal agents.
   - Entomological monitoring.
   - Migratory patterns leading to malaria outbreaks.

8. ***Community Participation***
   Planning would be "bottom up" in which village *Panchayat* would be responsible for all matters related to health and development.

Progress of EMCP

Since 1997 the EMCP has been implemented in 1045 PHCs in 100 districts predominantly *Pf* malaria endemic and tribal dominated districts in the peninsular States namely Andhra Pradesh, Jharkhand, Gujarat, Madhya Pradesh, Chhattisgarh, Maharashtra, Orissa and Rajasthan covering 62.2 million population. In addition 19 cities/towns reporting high malaria cases have also been covered under the project in these states and in the state of Tamil Nadu, Karnataka, and West Bengal. Out of 100 EMCP Districts, 79% districts have recorded decline in Malaria incidence during 2003. Number of Pf cases has declined from 0.72 million in 1997 to 0.41 million in 2004.

8. NATIONAL ANTI-MALARIA PROGRAM: It is also decided by the government to drop the term "National Malaria Eradication Program" and renamed it with ***"National Anti-Malaria Program"*** in 1999. But soon this program has become the part of National Vector Borne Disease Control Program and coming under the Umbrella of National Rural Health Mission in 2005.

9. National Health Policy 2002

Goal: Reduction in mortality on account of malaria and other vector borne diseases by 50% by 2010 and efficient morbidity control.

10. NATIONAL VECTOR BORNE DISEASE CONTROL PROGRAM

The NVBDCP was started in 2004 before the launched of National Rural Health Mission under the commitments of Millennium Development Goals. A project was submitted to the Global fund to intensified Malaria Control in affected areas. Details is given below.

11. National Rural Health Mission

The National Vector Borne Diseases Control Program is included in core activity of National Rural Health Mission. It is aimed at augmenting and ensuring appropriate public health focus in rural areas and particularly among the vulnerable groups therein, en-route to improve access to primary health care, prevention and control of communicable diseases and promotion of healthy life styles. These are in tandem with the Millennium Development Goal 6 of combating HIV/AIDS, malaria and other diseases; and target of

halting and beginning to reverse the incidence of malaria and other major disease.

Millennium Development Goals

Reduction of malaria morbidity and mortality is important to meet the overall objectives of reducing poverty.

12. Intensified Malaria Control Project

This is started in 2005 with the assistance of Global Fund for AIDS, Tuberculosis and Malaria (GFATM) in NE states, Orissa, Jharkhand and West Bengal with the following objectives:

1. To increase access to rapid diagnosis and treatment through community participation;
2. To reduce malaria transmission through risk reduction by use of insecticide treated bednets and larvivorous fish;
3. To enhance awareness about malaria control; and
4. To promote community, NGO, and private sector participation.

For strengthening early case detection and prompt treatment, 4,99,970 drug Distribution Centers (DDCs), Fever Treatment Depots (FTDs) and Malaria clinics have been established in the country till 2005. This is in addition to the treatment facilities available at the health facilities and hospitals. Anti Malaria drugs and funds for training are provided to them by the government of India. On an average, nearly 100 million fever cases are examined yearly.

NRHM expected outcome is reduction in malaria mortality by 50% up to 2010 and additional 10% by 2012.

NATIONAL FRAMEWORK FOR MALARIA ELIMINATION IN INDIA (2016–2030)

VISION

Eliminate malaria nationally and contribute to improved health, quality of life and alleviation of poverty.

GOALS

In line with the WHO Global Technical Strategy for Malaria 2016–2030 (GTS) and the Asia Pacific Leaders Malaria Alliance Malaria Elimination Roadmap, the goals of the National Framework for Malaria Elimination in India 2016–2030 are:

- Eliminate malaria (zero indigenous cases) throughout the entire country by 2030; and
- Maintain malaria–free status in areas where malaria transmission has been interrupted and prevent re-introduction of malaria.

OBJECTIVES

The Framework has four objectives:

- Eliminate malaria from all 26 low (Category 1) and moderate (Category 2) transmission states/union territories (UTs) by 2022;
- Reduce the incidence of malaria to less than 1 case per 1000 population per year in all states and UTs and their districts by 2024;
- Interrupt indigenous transmission of malaria throughout the entire country, including all high transmission states and union territories (UTs) (Category 3) by 2027; and
- Prevent the re-establishment of local transmission of malaria in areas where it has been eliminated and maintain national malaria-free status by 2030 and beyond.

Table 11A2: Classification of states on the basis of API

S. No.	Categories of states/UTs	Definition
1.	**Category 0:** Prevention of re-establishment phase	States/UTs with zero indigenous cases of malaria.
2.	**Category 1:** Elimination phase	States/UTs (15) including their districts reporting an API of less than 1 case per 1000 population at risk.
3.	**Category 2:** Pre-elimination phase	States/UTs (11) with an API of less than 1 case per 1000 population at risk, but some of their districts are reporting an API of 1/1000 or above.
4.	**Category 3:** Intensified control phase	States/UTs (10) with an API of 1 case per 1000 population at risk or above.

STRATEGIC APPROACHES

1. Programme phasing Malaria elimination in India will be carried out in a phased manner because various parts of the country differ in their malaria endemicity due to differences in their eco-epidemiological settings, socioeconomic conditions, health system development and malaria control accomplishments. Malaria incidence in high transmission areas (Category 3) must be lowered first before it is possible and rational to investigate each case. States/UTs will be subdivided into four categories with annual parasite incidence (API) as the primary criteria, and the annual blood examination rate (ABER) and slide positivity rate (SPR) as secondary criteria. Category specific milestones and targets will be set up and strategies implemented subsequently.
   Table 11A2: Classification of states/UTs based on API as primary criteria

2. District as the unit of planning and implementation
   Apart from the category to which they belong, each state/UT will be advised to further classify their districts so that even if a state/UT is not yet in the elimination phase, but has some districts with an API below 1 case per 1000 population at risk, those may be considered eligible for initiating elimination phase activities provided they meet the secondary criteria. In addition, states/UTs may also sub-classify districts into community health centres, community health centres into primary health centres, primary health centres into sub-centres, and sub-centres into villages for localized planning and implementation.
3. of malaria is being reported from states in the eastern, central and north-eastern part of the country, such as Odisha, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Tripura and Meghalaya. Most of these states are characterized by widespread hilly, tribal, forested and conflict-affected areas which are pockets of high malaria transmission. An aggressive scaling up of existing interventions, intensification of all malaria control activities and innovative strategies and partnerships will be carried out in these high endemic pockets to rapidly reduce malaria morbidity and mortality.
4. Special strategy for P. vivax elimination
   According to the World Malaria Report 2015, more than 80% of the global P. vivax burden is contributed by 3 countries including India. This serious challenge to malaria elimination efforts within the country will require special measures to be undertaken, such as good quality microscopy to detect all P. vivax infections, operational research to estimate prevalence of G6PD deficiency in the population, appropriate vector control measures, and ensuring good compliance to 14-day radical treatment with primaquine in affected individuals. These measures are in line with the WHO Control and Elimination of Plasmodium vivax Malaria – A Technical Brief.

MILESTONES AND TARGETS

By end of 2016 All states/UTs have included malaria elimination in their broader health policies and planning frameworks.

By 2020

- Transmission of malaria interrupted and zero indigenous cases and deaths due to malaria attained in all 15 states/UTs under Category 1 (elimination phase) in 2014 (base year).
- All 11 states/UTs under Category 2 (pre-elimination phase) in 2014 enter into Category 1 (elimination phase).
- Five states/UTs under Category 3 (intensified control phase) in 2014 enter into Category 2 (pre-elimination phase).
- Five states/UTs under Category 3 (intensified control phase) in 2014 reduce malaria transmission but continue to remain in Category 3.
- An estimated reduction in malaria of 15–20% at the national level compared with 2014.
- Additionally, progressive states with strong health systems such as Gujarat, Maharashtra and Karnataka may implement accelerated malaria elimination programmes to achieve interruption of transmission and demonstrate early elimination followed by sustenance of zero indigenous cases.

By 2022

- Transmission of malaria interrupted and zero indigenous cases and deaths due to malaria attained in all 26 states/UTs that were under Categories 1 and 2 in 2014.

- Five states/UTs which were under Category 3 (intensified control phase) in 2014 enter into elimination phase.
- Five states/UTs which were under Category 3 (intensified control phase) in 2014 enter into pre-elimination phase.
- An estimated reduction in malaria of 30–35% at the national level compared with 2014.

By 2024

- All states/UTs and their respective districts reduce API to less than 1 case per 1000 population at risk and sustain zero deaths due to malaria while maintaining fully functional malaria surveillance to track, investigate and respond to each case throughout the country.
- Transmission of malaria interrupted and zero indigenous cases and deaths due to malaria attained in all 31 states/UTs.
- Five states/UTs which were under Category 3 (intensified control phase) in 2014 enter into elimination phase.

By 2027

The indigenous transmission of malaria in India interrupted.

Table 11A3: Key Indicators to measures the progress

S. No.	IMPACT
1.	Number and incidence rate of confirmed malaria cases classified according to sex, age, parasite species and other relevant parameters.
2.	Number and incidence of severe malaria cases as well as case fatality rate.
3.	Number of malaria cases in pregnancy.
4.	Number and type of malaria foci (in areas eligible for elimination).
5.	Number of confirmed deaths due to malaria.
6.	Number of states/UTs which have eliminated malaria and are currently in the phase of prevention of re-establishment of local transmission.
7.	Number of states/UTs which are in elimination phase.
8.	Number of states/UTs which are in pre-elimination phase.
9.	Number of states/UTs which are in intensified control phase.
	OUTCOME
10.	Proportion of population at risk who slept under an insecticide-treated net/LLIN the previous night.
11.	Proportion of population at risk protected by indoor residual spraying within the past 12 months.
12.	Proportion of patients with confirmed malaria who received anti-malarial treatment as per national policy.
13.	Proportion of cases investigated and classified (in areas eligible for elimination).
14.	Proportion of foci investigated and classified (in areas eligible for elimination).
15.	Proportion of expected monthly reports received from health facilities at the national and subnational level.

By 2030

- The re-establishment of local transmission prevented in areas where malaria has been eliminated. • The malaria-free status maintained throughout the nation.

NATIONAL VECTOR BORNE DISEASES CONTROL PROGRAM

In pursuance of the concept of convergence, the government of India has approved a National Vector Borne Disease Control Program (NVBDCP) from the year 2003-04. This program is going to control six diseases namely malaria, kala-azar, filaria, Japanese encephalitis, and dengue fever and chikungunya. The program is 100% centrally assisted in northeastern region.

Strategies for Rural Areas

1. Early case Detection and Prompt Treatment (EDPT)

- EDPT is the main strategy of malaria control – radical treatment (complete cure) is necessary for all the cases of malaria to prevent progression of uncomplicated malaria to severe malaria, prevention of deaths, prevention of transmission of malaria and minimizing risk of selection and spread of drug resistant parasite.
- Chloroquine is the main anti-malaria drug for uncomplicated malaria.
- Drug Distribution Centres (DDCs) and Fever Treatment Depots (FTDs) have been established in the rural areas for providing easy access to antimalarial drugs to the community.
- Alternative drugs for chloroquine resistant malaria are recommended as per the drug policy of malaria.

It is observed that *P.falciparum* infection may lead to complications in 0.5% to 2% of cases. But in some cases such as Army units in Assam 3-5% developed complications (Pardal et al 2009). Mortality may result in about 30-50%% of such cases if timely treatment is not given. Use of an appropriate anti malaria drug is very important not only to save the life of patients suffering from *P.falciparum* cases but also to contain the spread of this species.

In the new drug policy it has been stressed that all fever cases clinically suspected of malaria should preferably be investigated for confirmation of malaria by Microscopy or Rapid Diagnostic Kit (RDK) so as to ensure full therapeutic dose with appropriate drug to all confirmed cases. Presumptive treatment with incomplete dose of chloroquine has been stopped and it has been stressed to treat patients on the basis of clinically suspected cases rather than only fever. If a patient is suspected of having malaria i.e. showing signs and symptoms of malaria without any other obvious causes, which cannot be immediately confirmed, full treatment with chloroquine should be given. Health agencies and volunteers running Fever Treatment Depots like ASHAs in inaccessible areas are being provided with rapid diagnostic kits for diagnosis of *P.falciparum* cases and to ensure full radical treatment to all confirmed malaria cases. Further, the National Malaria Treatment Guidelines also recommend that change of drug should be considered when treatment failure proportion exceeds 10%.

According to WHO: An antimalarial treatment policy is a set of recommendations and regulations concerning the availability and rational use of antimalarial drugs in a country. It should be the part of the national essential drug policy and the national malaria control policy and in line with the overall national health policy. An effective treatment policy should aim to:

- Reduce morbidity
- Prevent the progression of uncomplicated disease into severe and potentially fatal disease and thereby reduce malaria mortality
- Reduce the impact of placental malaria infection and maternal malaria-associated anemia through personal protection methods by use of impregnated bed nets.
- Prevent or delay the development of antimalarial drug resistance by correct diagnosis and rational treatment of all malaria positive cases.

The National Drug Policy on Malaria was first devised in 1982. Thereafter the policy is being reviewed periodically by the expert committee on chemotherapy of malaria constituted by Director General of Health Services. The recent revised policy has been published in 2013.

Drug schedule for malaria is given in National Malaria Drug Policy.

2. Vector Control

(i) Chemical Control

- Use of Indoor Residual Spray (IRS) with insecticides recommended under the program
- Use of chemical larvicides like Abate in potable water
- Aerosol space spray during day time
- Malathion fogging during outbreaks

(ii) Biological Control

- Use of larvivorous fish in ornamental tanks, fountains etc.
- Use of biocides.

(iii) Personal Prophylactic Measures that individuals/communities can take up

- Use of mosquito repellent creams, liquids, coils, mats etc.
- Screening of the houses with wire mesh
- Use of bednets treated with insecticide
- Wearing clothes that cover maximum surface area of the body

3. Community Participation

- Sensitizing and involving the community for detection of Anopheles breeding places and their elimination
- NGO schemes involving them in program strategies
- Collaboration with CII/ASSOCHAM/FICCI

4. Environmental Management & Source Reduction Methods

- Source reduction i.e. filling of the breeding places
- Proper covering of stored water
- Channelization of breeding source

5. Monitoring and Evaluation of the program

- Monthly Computerized Management Information System (CMIS)
- Field visits by state by State National Program Officers
- Field visits by Malaria Research Centers and other ICMR Institutes
- Feedback to states on field observations for correction actions.

URBAN MALARIA SCHEME

History

Considering the recommendations of the Health Survey and Development Committee of Govt. of India, 1946 and also keeping in view the widespread adverse effect of malaria on the national health, economy, industrial and agriculture growth in the country, the planning commission accorded highest priority to a nationwide malaria control program.

The remarkable success of the NMCP and the fact that malaria had been eradicated in certain countries paved the way for launching the National Malaria Eradication Program (NMEP) in the country in 1958. In the plan of operations under NMEP, all roofed structures in the rural areas received insecticidal coverage under the attack phase, excepting those in urban towns with population of over 40,000. In such areas the residual insecticidal coverage was confined only to the houses in the peripheral belt to a depth of 0.5 to 1.0 mile.

In rest of the area in such towns and cities, the antilarval measures were recommended. The implementation of antilarval measures was made the responsibility of the local bodies. Many of the local bodies that had been carrying out antilarval operations earlier failed to continue the same due to paucity of funds. While on other side, the activities of NMEP have brought down malaria incidence considerably in rural areas. The malaria incidence in towns and cities went up manifold after 1963. This was mainly due to the species, *A.stephensi*, supplemented by *A.culicifacies* mosquitoes breeding in wells, cisterns, low-lying areas and wet cultivations within the urban limits. It has also been observed in some towns of Andhra Pradesh and Tamil Nadu that A. stephensi had also started breeding in drains and pools. Secondly, there have been tremendous developmental activities in the urban areas of the country leading to conditions very favorable for mosquito breeding. As a result of this, malaria now being freely disseminated from urban areas to rural areas by the free movement of people to the big cities and towns in search of employment in various developmental activities like industries, constructions, etc. While moving out of urban areas they carry the infection to rural areas that are already cleared of malaria. Thus the fresh foci of transmission are established in rural areas.

The control of malaria in the urban areas was thought to be an important strategy complimentary to the NMEP for rural areas. Modified Plan of Operation (MPO) was designed and submitted to the Cabinet to

tackle the malaria situation in both urban and rural areas in the country simultaneously. Under MPO, it was decided to initiate antilarval and antiparasitic measures to abate the malaria transmission in urban areas. The proposal to control malaria in towns was named as Urban Malaria Scheme (UMS) which was approved during 1971. It was envisaged that 132 towns would be covered under the scheme in a phased manner. This scheme was sanctioned during November, 1971 and the expenditure on this scheme is treated as plan expenditure in centrally sponsored sector. The central assistance under this scheme was treated 100 per cent grant to the State Governments, in kind or in cash. From 1979-80, the expenditure on this scheme is being shared between the centre and the state Governments on 50:50 basis.

Initially only 23 towns worst affected with malaria were approved by the Ministry of Health & Family Welfare for assistance under this scheme. During 1972-73, five more towns were selected. Due to drastic cut in the budget, only these 28 towns continued to receive assistance under Urban Malaria Scheme and no more towns were brought under this scheme till 1976-77. Again, a fresh approach was made to the Ministry of Health and Family Welfare and additional 87 towns were brought under this scheme in three phases – (1977-78 :38, 1978-79:37 and 79-80:12). During 1980-81, it was proposed to extend the activities of Urban Malaria Scheme to 17 additional towns worst affected with malaria. At present scheme is functioning in 131 towns.

Objectives

In malaria control program, the main aim is the reduction of the disease to a tolerable level in which the human population can be protected form malaria transmission with the available means.

The main objectives of Urban Malaria Scheme (UMS) are:

a. To control malaria by reducing the vector population in the urban areas
b. Reduce morbidity and mortality through EDPT.

Norms

a. The towns should have a minimum population of 50,000.
b. The API should be 2 or above.
c. The towns should promulgate and strictly implement the civic by-laws to prevent/eliminate domestic and peri-domestic breeding places

Strategy

a. Early case detection & prompt treatment (EDPT) to patients through passive surveillance institutions such as hospitals, dispensaries and malaria clinics.
b. Recurrent anti-larval measures through conventional larvicides in towns.
c. Minor engineering methods like source reduction, channelisation, de-weeding, etc.
d. Biological control using larvivorous fish at appropriate breeding sites.
e. IEC campaigns for community awareness and their involvement.

Epidemiological Situation

About 7.8 % of the total cases of malaria are reported from urban areas. Maximum numbers of malaria cases are reported from Chennai, Vishakapatnam, Vijayawada Vadodara, Allahabad, Badaun, Bellary, Kolkata, Greater Mumbai, Pune, Ratlam etc.

Anopheles stephensi - domestic water breeder an important vector of Urban Malaria

- Container breeder
- Piped water supply system
- Overhead and storage tanks
- Water storage at construction sites
- Wells
- Desert coolers

Aedes aegypti - domestic habitat species

This species breeds in domestic and peri-domestic water collections in a variety of containers in association with Anopheles stephensai. In outdoor, old tyres and drums are most preferred sites.

Culex quinquefasciatus - Pest mosquito

The breeds mainly in sullage lakes around houses under unorganized sectors, drains, septic tanks.

Control Strategies

The control measures recommended under UMS are as follows:

Source Reduction

Environmental methods for controlling most of the breeding include source reduction by filling ditches,

areas, pits, low lying areas, streamlining, channelising, desilting, deweeding, trimming of drains, water disposal and sanitation, empty water container once in a week, etc.

Chemical Control

Recurrent anti-larval measures with approved larvicides to control the vector mosquitoes are recommended. The following larvicides are used under UMS

- Temephos
- Fenthion

Biological Control

Biological control of mosquito breeding through biological agents specially larvivorous fish and by larvicides (Figure 11A.3).

Aerosol Space Spray

Space spraying of Pyrethrum extract (2%) in 50 houses in and around every malaria positive case to kill the infective mosquitoes.

Antiparasitic measures

Antiparasitic measures through passive agencies like hospitals, dispensaries, clinics and private practitioners to reduce the reservoir of infection, by early case detection and prompt treatment.

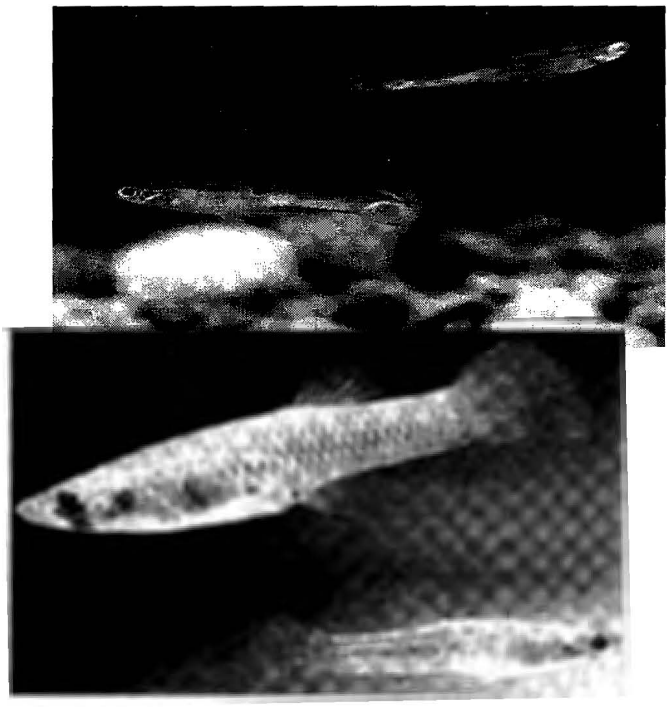


Figure 11A.3: Biological Methods

Organizational Setup

The Urban Malaria Scheme is a centrally sponsored program being implemented mainly by local administrative authorities/Municipalities under the active supervision of state health authorities. The scheme is implemented at the following levels:

- ***Town level*** - Biologist is the in-charge of the program implementation
- ***State level*** - Additional Director (Malaria & Filaria) or Joint Director (Malaria & Filaria) or Deputy Director (Malaria & Filaria) is the in-charge of the scheme at state level and also supervise the scheme by offering technical and administrative guidelines for better execution of the scheme.
- ***Central Level*** - Director NVBDCP monitors the UMS at central level monitors the scheme and provides technical guidance for its implementation. The Director of NVBDCP supplies the approved items as per the norms directly to the UMS towns.

MALARIA SURVEILLANCE

Malaria surveillance connotes the maintenance of an on-going watch/ vigil over the status of malaria in a group or community. The main purpose of surveillance is to detect changes in trends or distribution in malaria and other vector borne diseases in order to initiate investigative or control measures. It provides a basis for measuring the effectiveness of anti-malaria program. Malaria surveillance includes laboratory confirmation of presumptive diagnosis, finding out the source of infection and identification of all cases and susceptible contacts and still others who are at risk in order to prevent further spread of the disease.

The timely collection and examination of blood smear is the key element in the National Malarial Control Strategy. If all the detected cases are given radical treatment early, it will certainly lead to depletion of the human reservoir of malaria parasite in the community. There are some areas with poor therapeutic efficacy of the chloroquine or Sulfadoxine-Pyrimethamine against *P.falciparum*. In these areas, treatment is done with alternative drug regimen on microscopic confirmation of the diagnosis. Indiscriminate use of second line drugs like (Artesunate-Sulfadoxine Combination Therapy, ACT) under the presumptive

treatment is always disastrous and precipitates the multi drug resistant strains of *P.falciparum.* Therefore active case detection followed by appropriate treatment according to National Guidelines is essential for all areas of the country

Active Case finding: Fortnightly Domiciliary visits
Under the National Vector Borne Diseases Control Program, the active case detection is carried out by multipurpose health workers (male) under primary health care system. The fortnightly periodicity of domiciliary visits suits the technical requirement of malaria disease management. By fortnightly visits a large number of secondary cases can be avoided in the community where malaria transmission is seasonal but well established. Fortnightly surveillance is carried out because of the incubation interval in case of *P.vivax* is approximately 22 days while for *P.falciparum* it is 35 days. Thus, surveillance cycle of less than one incubation interval will catch most of the secondary cases before the commencement of next cycle. Components of the activities under the active case detection during fortnightly visits are:

1. Search for a fever case or who had fever in between the visits of MPW.
2. Collection of blood smear from such cases.
3. Administration of appropriate anti-malarial(s).

However, over the years, the strength of the MPWs(M) has been depleting. There is shortage of MPWs in all the states. In some states the shortage may be as high as 60% or more of the sanctioned strength.

Passive Case Detection (PCD)
All Allopathic, Ayurvedic, Homeopathic, Siddha medicine dispensaries in the health sector should be identified and involved in passive case detection. All the fever cases attending the hospital should be screened for malaria and given presumptive treatment. In addition this is to be carried out at the village level by voluntary workers drawn from local residents or voluntary agencies operating locally or Anganwadi workers, private practitioners etc. The District Malaria officers with the help of PHC staff should carry out the mapping for private clinics and other functionaries who can act as PCD center.

Malaria clinics are to be established in all the health institutions in high risk areas wherein the blood smears are examined on the same day and RT given.

MPW (M) should contact all FTDs/ DDCs/ Voluntary workers etc. of his area at least once a fortnight in his area and collect blood smears for transmission to laboratory, besides replenishing of micro slides and/ or drugs, wherever necessary.

Rapid Fever Survey: In case of an epidemic outbreak, every village in the suspected epidemic zone is covered in a short duration by deploying additional manpower. House to house visits are undertaken and all fever cases are screened by taking blood smears. These blood smears are to be examined at the earliest preferably at a temporary field laboratory at the village level.

Mass Survey: As an alternative to Rapid Fever Survey, mass survey of the entire population may be carried out in the suspected epidemic zone. Here all the population irrespective of age, sex or fever status is screened by taking blood smear. Specially children must be included in survey.

Annual Blood-Smears Examination Rate (ABER)
The level of ABER depends on the number of fever case in the community. The fever rate in the community fluctuates widely from month to month and year to year. These fluctuations are due to other viral and bacterial infections prevalent in the area. For accurate estimates of malaria endemicity, the blood smear examination rate specially the Monthly Blood Examination Rate (MBER) rate should be equal to fever rate of the month in the community. Therefore it is necessary to ensure that all persons having fever during malaria transmission months are included in the total blood slides examined during the year.

The MBER norms of 0.8 percent during non-transmission season and 1.2 to 1.8 percent during transmission season were laid down in the NVBDCP. In both the cases i.e. ABER and MBER the denominator is common because the entire population is covered during each fortnightly domiciliary visit by MPW (M). ABER is the cumulative sum of monthly rates during the year. However, number of blood smears collected and examined during a mass survey and their results should not be included while calculating ABER

or MBER.

MBER

$$\frac{\text{No. of blood smears examined during the month}}{\text{Population covered under surveillance}} \times 100$$

ABER

$$\frac{\text{No. of blood smears examined during the year}}{\text{Population covered under surveillance}} \times 100$$

ABER/ MBER is an index of operational efficacy of the program. The Annual Parasite Incidence (API) depends upon the ABER. A sufficient number of blood slides should be systematically obtained and examined for malaria parasite to work out accurate API.

Annual Parasite Incidence (API)

$$\frac{\text{Confirmed cases of malaria during one year}}{\text{Population covered under surveillance}} \times 1000$$

Slide Positivity Rate (SPR):

The Slide Positivity Rate among the blood smears collected through both active and passive surveillance gives more accurate information on distribution of malaria infection in the community over a period of time. Monthly SPR can be calculated to find out the seasonal rise and fall in malaria prevalence in the community. SPR among children 2-9 years of age can be utilized for comparison with pre-control Child Parasite Rates to assess the impact of control measures on local malaria endemicity and transmission. SPR in the age group of less than one year (Infant Parasite Rate) can be utilized for assessment of the impact of control operations. The SPR of blood slides collected from cases currently having fever will be higher than the SPR of the slides collected from cases with history of fever. Therefore, higher positivity rates are obtained in blood smears collected at the PCD. Trends in SPR can be utilized for predicting epidemic situations in the area. If monthly SPR exceeds by 2 ½ times of the standard deviation observed in SPR of the preceding 3 years or preceding 3 months of the same year, an epidemic build up in the area can be suspected. Monthly or yearly trends of SPR are utilized to study the impact of control operations. SPR is measured as follows:

$$\frac{\text{No. of blood smears found positive for malaria parasite}}{\text{No. of blood smears examined}} \times 100$$

NATIONAL DRUG POLICY FOR MALARIA 2013

During recent years it has been observed that chloroquine resistance is widely spread as per the results of the drug sensitivity studies conducted. This is a serious concern to the program as species is responsible for mortality. It is observed that *P.falciparum* infection may lead to complications in 0.5% to 2% of cases. Mortality may result in about 30% of such cases if timely treatment is not given. A single dose of chloroquine may save the life in *P.falciparum* cases by averting complications.

The WHO technical advisory group on malaria has recommended that the member countries should be discouraged from implementing presumptive, single-dose and incomplete treatment with chloroquine. If a patient is suspected of having malaria which cannot be immediately confirmed, full treatment with recommended drugs should be given. Health agencies and volunteers running fever treatment in inaccessible areas should be provided with rapid diagnostic kits for diagnosis and to ensure full radical treatment to confirmed malaria cases. Priority for treatment should be given to clinically suspected cases rather than on the basis of only fever. Further, the WHO malaria treatment guidelines also recommend that anti malarial treatment policy should be changed when treatment failure rates are considerably lower i.e. the initiation of alternative treatment regimen at the treatment failure proportion exceeds 10%. The reasons attributed for implications of using drugs with low efficacy is that once the drug resistance has emerged in a locality, the continued use of the failing drug will result in the rapid spread of drug resistance in the area.

The main purpose of the national anti-malaria drug policy is to provide a framework for the safe and effective treatment of uncomplicated and severe malaria as well as prevention of malaria in travellers and vulnerable groups, such as pregnant women and young children. All health care providers in both the public and private sectors must be aware of, understand the rationale for, and implement the national anti-malaria drug policy. An effective treatment policy should aim to:

- Reduce morbidity
- Prevent the progression of uncomplicated disease into severe and potentially fatal disease and thereby reduce malaria mortality
- Reduce the impact of placental malaria infection and maternal malaria-associated anemia through chemoprophylaxis or preventive intermittent therapy
- Prevent or delay the development of antimalarial drug resistance by correct diagnosis and rational treatment of all malaria positive cases.
- Prevention of relapse by administration of radical treatment
- Interruption of transmission of malaria by use of gamatocytocidal drugs.

Aims of malaria case management:

- To provide prompt and complete treatment to all suspected/ confirmed cases of malaria
- To prevent progression of mild cases of malaria in to severe or complicated from of malaria
- To prevent deaths from severe and complicated malaria
- To prevent transmission of malaria
- To minimize risk of spread of drug resistant parasites by use of effective drugs in
- appropriate dosage by everyone.

Management of malaria case:

Diagramatic representation of malaria case management is given in figure 11A.4

- Clinical diagnosis of malaria on the basis of sign and symptoms;
- Confirmation of malaria by Laboratory diagnosis/Rapid Diagnostic Kit (RDK);
- Referral to secondary/tertiary level of care, if necessary;
- Education of patient or family on:
  - administration of the drugs
  - when to report to health facility
  - danger symptoms
  - prevention of malaria
- Dispensing the correct drugs of assured quality, (first dose be given preferably by dispenser); and
- Patient compliance as per instructions.

Categories for the treatment of malaria include drugs for *first line of treatment* (treatment given to clinical or confirmed malaria), *second line of treatment*: given to Treatment failure, severe and complicated malaria, pregnant women, travelers and mass treatment (recommended in epidemics).

Anti malaria drugs

1) Schizonticidal drugs for clinical and parasitological cure

** Chloroquine, Amodiaquine, Quinine, Quinidine, Pyrimethamine, Trimethoprim, Proguanil, sulfonamides in combination with Pyrimethamine, Mefloquine, Halofantrine, Artemisinine and its derivatives like Artesunate, Artemether, Arteether.*

2) Gametocytocidal and anti-relapse drugs.

** Primaquine, 8-Aminoquinolines groups, only compound having action on gametocytes and Hypnozoites.*

Status of Drug Resistance in India

Drug Resistance: Malaria

Anti-malarial drug resistance is a major public health problem, which hinders the control of malaria. In India resistance of ***Plasmodium falciparum*** to chloroquine, the cheapest and the most used drug was first reported in the year 1973 from Diphu of Karbi-Anglong district in Assam state. The Directorate of National Vector Borne Diseases Control Program has been monitoring the response of antimalarial drug in *Pf* malaria parasite in the country since 1978 through 13 monitoring teams located in 11 Regional Office for Health & Family Welfares.

Tools for monitoring

Till 2002 drug sensitivity status in the country was assessed following conventional WHO In-vivo protocol. From 2002-03 onward, new WHO protocol on "Therapeutic efficacy of antimalarial drugs in uncomplicated ***P.falciparum*** malaria" is being followed to assess the efficacy of antimalarial drugs. The classification of response according to new protocol (treatment failure/ Drug Resistant) is interpreted into three categories as per the WHO criteria:

1. ***Adequate Clinical and Parasitological Response (ACPR):*** After treatment patient is considered cured if he/she does not have fever or parasitaemia till Day 28.

2. ***Early Treatment Failure (ETF):*** Development of danger signs or severe malaria on day 1,2, or 3 in the presence of parasitaemia on Day 2 higher than on Day 0, irrespective of axillary temperature; parasitaemia on Day 3 with axillary temperature $>37.5^0$ C; and parasitaemia on Day 3 > 25% of count on Day 0.
3. ***Late Treatment Failure (LTF):*** development of danger signs or severe malaria in the presence of parasitaemia on any day between Day 4 and Day 28 (Day 42) in patients who did not previously meet any of the criteria of early treatment failure; and presence of parasitaemia on any day between Day 4 and Day 28 (Day 42) with axillary temperature $>37.5^0$ C in patients who did not previously meet anu of the criteria of early treatment failure.

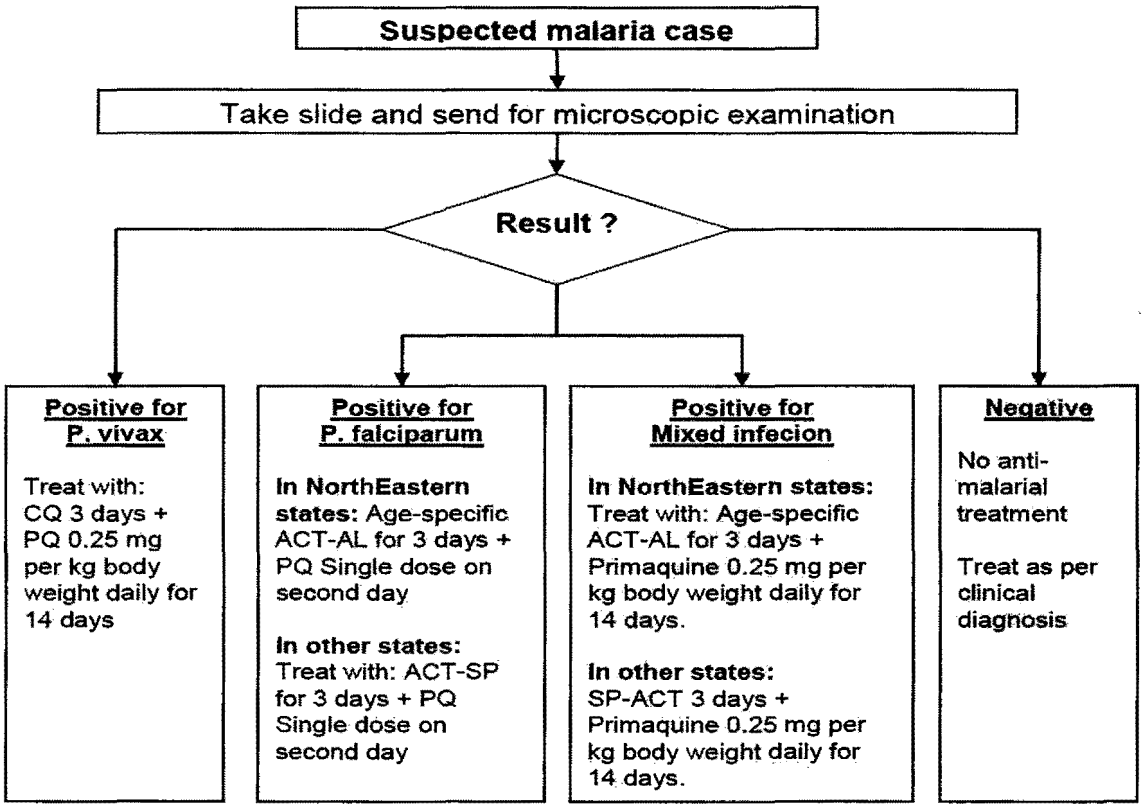
Late Parasitaemia failure: presence of parasitaemia on any day between Day 7 and Day 28 with axillary temperature $<37.5^0$C in patients who did not previously meet any of the creteria of early treatment or late clinical failure such patient should be given alternative ACT or quinine with Doxycycline. Doxycycline is contraindicated inpregnancy, lactation and in children upto 8 years.

Criteria for change of drug policy

Drug policy is changed for the area/Block PHC reporting 10% or more total treatment failure

Figure 11A.4

Where microscopy result is available within 24 hours


Suspected malaria case
Take slide and send for microscopic examination
Result ?
Positive for P. vivax
Treat with: CQ 3 days + PQ 0.25 mg per kg body weight daily for 14 days
Positive for P. falciparum
In NorthEastern states: Age-specific ACT-AL for 3 days + PQ Single dose on second day
In other states: Treat with: ACT-SP for 3 days + PQ Single dose on second day
Positive for Mixed infecion
In NorthEastern states: Treat with: Age-specific ACT-AL for 3 days + Primaquine 0.25 mg per kg body weight daily for 14 days.
In other states: SP-ACT 3 days + Primaquine 0.25 mg per kg body weight daily for 14 days.
Negative
No anti-malarial treatment
Treat as per clinical diagnosis

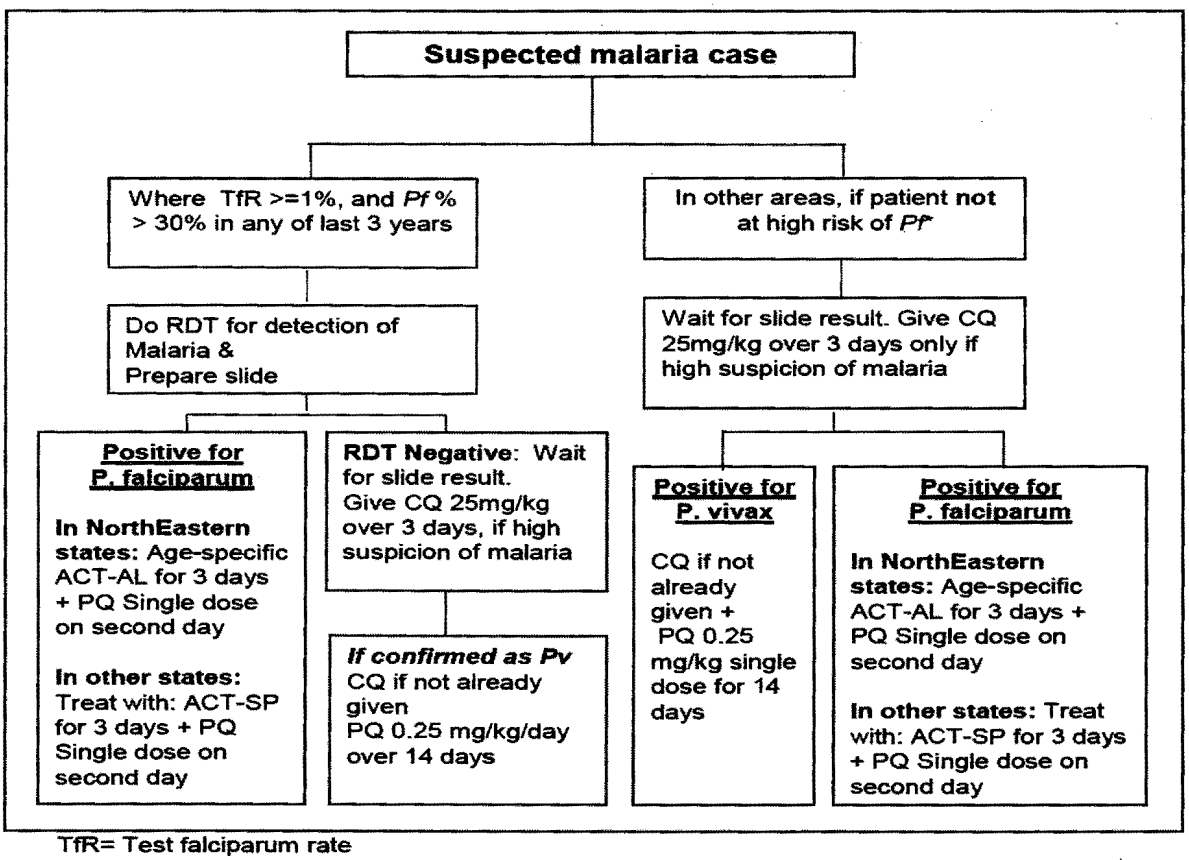
ACT-AL - Artemisinin-based Combination Therapy- Artemether - Lumefantrine

ACT-SP- Artemisinin-based Combination Therapy (Artesunate+Sulfadoxine-Pyrimethamine)

CQ - Chloroquine

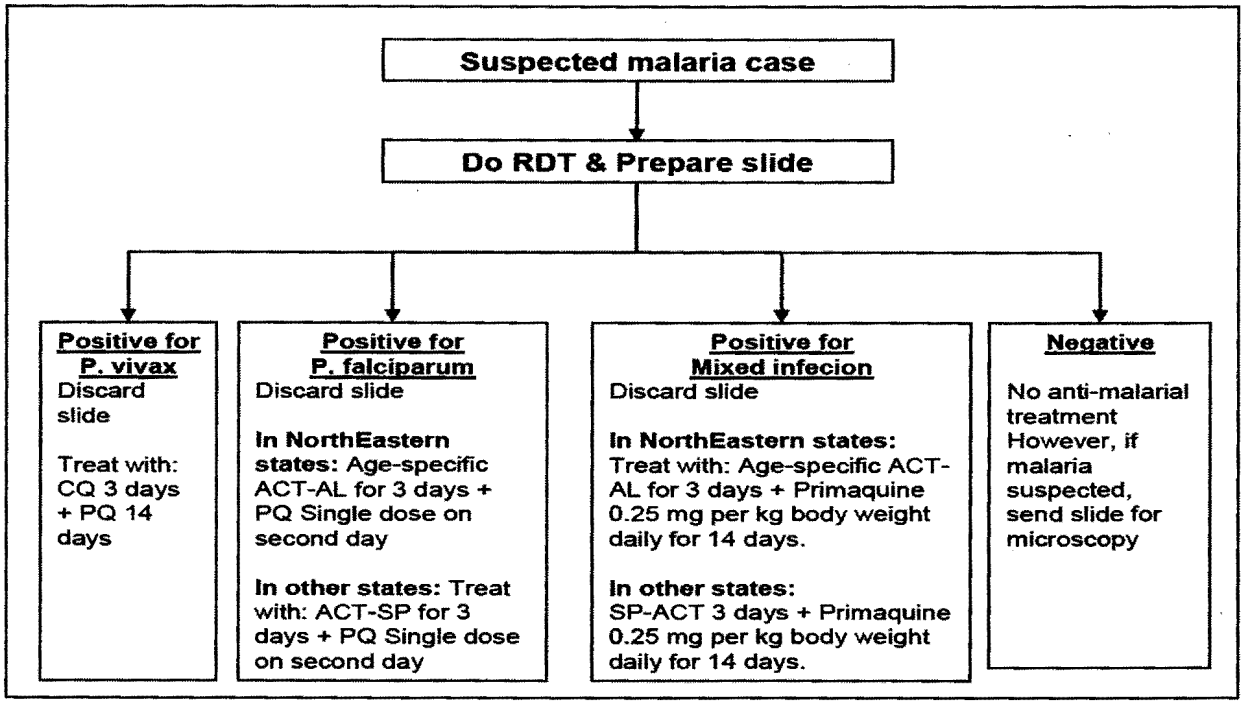
PQ - Primaquine

Where microscopy result is not available within 24 hours and Monovalent RDT is used


Suspected malaria case
Where TfR >=1%, and *Pf* % > 30% in any of last 3 years
In other areas, if patient not at high risk of *Pf*
Do RDT for detection of Malaria & Prepare slide
Wait for slide result. Give CQ 25mg/kg over 3 days only if high suspicion of malaria
Positive for P. falciparum
In NorthEastern states: Age-specific ACT-AL for 3 days + PQ Single dose on second day
In other states: Treat with: ACT-SP for 3 days + PQ Single dose on second day
RDT Negative: Wait for slide result. Give CQ 25mg/kg over 3 days, if high suspicion of malaria
If confirmed as Pv
CQ if not already given
PQ 0.25 mg/kg/day over 14 days
Positive for P. vivax
CQ if not already given + PQ 0.25 mg/kg single dose for 14 days
Positive for P. falciparum
In NorthEastern states: Age-specific ACT-AL for 3 days + PQ Single dose on second day
In other states: Treat with: ACT-SP for 3 days + PQ Single dose on second day

TfR= Test falciparum rate

Where microscopy result is not available within 24 hours and Bivalent RDT is used


Suspected malaria case
Do RDT & Prepare slide
Positive for P. vivax
Discard slide
Treat with: CQ 3 days + PQ 14 days
Positive for P. falciparum
Discard slide
In NorthEastern states: Age-specific ACT-AL for 3 days + PQ Single dose on second day
In other states: Treat with: ACT-SP for 3 days + PQ Single dose on second day
Positive for Mixed infecion
Discard slide
In NorthEastern states: Treat with: Age-specific ACT-AL for 3 days + Primaquine 0.25 mg per kg body weight daily for 14 days.
In other states: SP-ACT 3 days + Primaquine 0.25 mg per kg body weight daily for 14 days.
Negative
No anti-malarial treatment However, if malaria suspected, send slide for microscopy

(ETF+LTF) to the tested drug i.e the currently used antimalarials in a sample of minimum 30 P.falciparum test cases. To combat the drug resistant in malaria, the National Drug Policy on Malaria recommends the use of combination therapy i.e Artesunate plus Sulfadoxine Pyrimethamine for treatment of ***P.falcipuram*** cases in chloroquine resistant areas, surrounding cluster of Blocks and 117 high endemic districts of 7 North Eastern States and state of Andhra Pradesh, Chhatisgarh, Jharkhand, Madhya Pradesh & Orissa.(Arora et al 2008). At present ACT (AS+SP) combination is being implemented in 117 districts (i.e 50 high endemic districts of States namely Andhra Pradesh, Chhatisgarh, Jharkhand, Madhya Pradesh & Orissa + 67 in North Eastern States), in addition to 253 PHCs of 46 districts included on the basis of chloroquine resistance status and its surrounding cluster of Blocks.

Guidelines for management of malaria case Diagnosis and treatment are presented in figure 11.4

Treatment of uncomplicated malaria

1. All fever cases suspected to be malaria should be investigated by microscopy or Rapid Diagnostic Test (RDT).

2. *P.vivax* cases should be treated with chloroquine for three days and Primaquine for 14 days.

3. Primaquine is used to prevent relapse but is contraindicated in pregnant women, infants and individuals with G6PD deficiency.

Note: Patients should be instructed to report back in case of hematuria or high colored urine / cyanosis or blue coloration of lips and Primaquine should be stopped in such cases. Care should be taken in patients with anaemia.

Avoid starting treatment on an empty stomach. The first dose should be given under observation. Dose should be repeated if vomiting occurs within 30 minutes. The patient should be asked to report back, if there is no improvement after 48 hours or if the situation worsen.

3. *P. falciparum* cases should be treated with ACT (Artesunate 3 days + Sulphadoxine-Pyrimethamine 1 day). This is to be accompanied by single dose primaquine on day 2.

4. Pregnant women with uncomplicated *P. falciparum* should be treated as follows:
* 1st Trimester: Quinine
* 2nd & 3rd Trimester: ACT

Note: Primaquine is contra indicated in pregnant woman

5. In cases where parasitological diagnosis is not possible due to non-availability of either timely microscopy or RDT, suspected malaria cases will be treated with full course of chloroquine, till the results of microscopy are received. Once the parasitological diagnosis is available, appropriate treatment as per the species, is to be administered. Cases positive for Pf by RDK should be treated with full therapeutic dose of chloroquine or ACT as per prescribed drug in that area. However negative cases showing sign and symptom of malaria without any other obvious causes should be considered as clinical malaria and treated with chloroquine in full therapeutic dose of 25 mg/kg body weight over three days. Such cases if later found positive may be treated accordingly.

6. Presumptive treatment with chloroquine is no more recommended.

7. Resistance should be suspected if in spite of full treatment with no history of vomiting, diarrhoea, patient does not respond within 72 hours, clinically and parasitologically. Such cases not responding to ACT, should be treated with oral quinine with Tetracycline / Doxycycline. These instances should be reported to concerned District Malaria /State Malaria Officer/ ROHFW for initiation of therapeutic efficacy studies.

8. Change of drug to second line of treatment may also be implemented in a cluster of Blocks around the resistant foci after taking into consideration the epidemiological trend of *P.falciparum* and approval of Directorate of NVBDCP.

9. Mefloquine should only be given to chloroquine/ multi resistant uncomplicated *P.falciparum* cases only in standard doses as prescribed by WHO against the prescription of medical practitioners supported by laboratory report showing asexual stage of *P.falciparum* parasite and not gametocyte alone and other species.

10. In severe and complicated *P.falciparum* malaria cases intravenous Quinine/ parenteral Artemisinine derivatives are to be given irrespective of chloroquine

resistance status. This treatment may continue till such time oral Quinine/Artemesinine derivatives become available.

11. Migratory labor/project population: Since these groups belong to high risk category they need to be screened on weekly basis and treated accordingly.

12. All the medical, paramedical and village level health volunteers should be adequately trained before their involvement in the program.

13. Chloroquine injection: Chloroquine is not well tolerated specially by infants or young children. In a patient of any age it may produce low blood pressure, sudden collapse with high mortality. Parenteral administration of Chloroquine is more hazardous than parenteral administration of quinine. It should be used only when Quinine or arteether injections are not available. It is given in doses of 3.5 mg/kg bw 8 hourly slowly in isotonic fluid. Total 24 hour dose should not exceed 600 mg base (up to 10 mg/kg bw). Dose of Chloroquine IM is 5 mg per kg bw.

14. Use of personal protective measures including insecticide treated bed nets should be encourage for pregnant women and other vulnerable population including traveller for longer stay. However, for longer stay in high Pf endemic districts by the military or paramilitary forces, the practice of chemoprophylaxis should be followed whenever appropriate e.g., troop on night patrol duty, etc. and decision of their medical administration authority should be followed.

DRUG SCHEDULE FOR TREATMENT OF MALARIA UNDER NVBDCP

Treatment of P.vivax cases

1. Chloroquine: 25 mg/kg body weight divided over three days i.e. 10mg/kg on day 1, 10mg/kg on day 2 and 5mg/kg on day 3.

2. Primaquine: 0.25 mg/kg body weight daily for 14 days.

Treatment of uncomplicated *P.falciparum* cases

In North-Eastern States (NE States):

1. ACT-AL Co-formulated tablet of ARTEMETHER (20 mg) - LUMEFANTRINE (120 mg)

(Not recommended during the first trimester of pregnancy and for children weighing < 5 kg)

2. Primaquine: 0.75 mg/kg body weight on day 2.

In other States:

1. Artemisinin based Combination Therapy (ACT-SP)

Artesunate (AS), available as 50 mg tablets are given for three days, and Sulfadoxine-Pyrimethamine (S-P) tablets, containing 500 mg Sulfadoxine and 25 mg pyrimethamine are given for one day. All tablets for a day should be taken together, swallowed with water. In addition, Primaquine (PQ Large) tablets should be given on the second day.

Dosage schedule:

1. Artemisinin based Combination Therapy (ACT-SP)*

Artesunate 4 mg/kg body weight daily for 3 days

Plus

Sulfadoxine (25 mg/kg body weight) and pyrimethamine (1.25 mg/kg body weight) on first day

And

Primaquine 0.75mg/kg on 2nd day

Treatment of uncomplicated *P.falciparum* cases in pregnancy

1st Trimester: Quinine salt 10mg/kg 3 times daily for 7 days.

Note: Quinine may induce hypoglycemia; pregnant women should not start taking quinine on an empty stomach and should eat regularly, while on quinine treatment.

2nd and 3rd trimester:

Area-specific ACT as per dosage schedule given above i.e. ACT-AL in North Eastern States and ACT-SP in other states.

Treatment of mixed infections (*P.vivax* + *P.falciparum*) cases

All mixed infections should be treated with full course of ACT and Primaquine 0.25 mg per kg body weight daily for 14 days.

In North-Eastern States: Treat with: Age-specific ACT-AL for 3 days + Primaquine 0.25 mg per kg body weight daily for 14 days.

In Other States: SP-ACT 3 days + Primaquine 0.25 mg per kg body wt. daily for 14 days.

Teatment of *P. ovale* and *P. malariae:*

In India these species are very rarely found in few

Dosage Chart for Treatment of *Vivax* Malaria

Age*	Day 1		Day 2		Day 3		
	CQ (250 mg)	PQ (7.5 mg)	CQ (250 mg)	PQ (15 mg)	CQ (250 mg)	PQ (15 mg)	PQ (22.5 mg)
Less than 1 yr	½	0	½	0	¼	0	0
1-4 years	1	1	1	1	½	1	1
5-8 years	2	2	2	2	1	2	2
9-14 years	3	4	3	4	1½	4	4
15 yrs or more*	4	6	4	6	2	6	6
Pregnancy	4	0	4	0	2	0	0

places. P. ovale should be treated as P. vivax and P. malariae should be treated as P. falciparum.

Once a suspected case is diagnosed positive by RDT or microscopy, treatment is started. The first dose is always taken in the presence of the health volunteer/ worker. The blister pack with remaining tablets is given to the patient/caretaker to take home with clear instructions.

Treatment of severe malaria cases

Severe malaria is an emergency and treatment should be given as per severity and associated complications which can best be decided by the treating physician.

Criteria for immediate referral to Primary Health Centre:

a) Persistence of fever after 24 hours of initial treatment.
b) Continuous vomiting and inability to retain oral drugs.
c) Headache continues to increase
d) Severe dehydration – dry, parched skin, sunken face
e) Too weak to walk in the absence of any other obvious reason
f) Change in sensorium e.g. confusion, drowsiness, blurring of vision, photophobia, disorientation
g) Convulsions or muscle twitchings
h) Bleeding and clotting disorders
i) Suspicion of severe anaemia
j) Jaundice
k) Hypothermia

The guidelines for specific antimalarial therapy is as follows:

Recommended regimen by weight and age group
The packing size for different age groups based on Kg bodyweight.

Co-formulated tablet ACT-AL	5-14 kg (>5 months to <3 years)	15-24 kg (>3 to 8 years)	25-34 kg (>9 to 14 years)	>34 kg (>14 years)
Total Dose of ACT-AL	20 mg/ 120 mg twice daily for 3 days	40 mg/ 240 mg twice daily for 3 days	60 mg / 360 mg twice daily for 3 days	80 mg / 480 mg twice daily for 3 days
		Pack size		
No. of Tablet In the Packing	6	12	18	24
Give	1 Tablet twice daily for 3 days	2 Tablet twice daily for 3 days	3 Tablets twice daily for 3 days	4 Tablets Twice daily for 3 days
Colour of the Pack	yellow	Green	Red	white

- **Artesunate:** 2.4 mg/kg body weight IV or IM given on admission (time = 0 h); then at 12 h and 24 h and then once a day. Care should be taken to dilute artesunate powder in 5% sodium bicarbonate provided in the pack.
  (or)
- **Artemether:** 3.2 mg/kg body weight IM given on admission and then 1.6 mg/kg body weight per day.
  (or)
- **Arteether:** 150 mg IM daily for 3 days in adults only (not recommended for children).
  (or)
- **Quinine:** Never use bolus injection dose of 20 mg/kg body weight on admission. IV infusion or divided IM injection should be given slowly. The infusion rate should not exceed 5 mg salt/kg body weight per hour. The maintenance dose of **10 7** mg/kg body weight 8 hourly if quinine need to be given beyond 48 hours.

Note: The parenteral treatment in severe malaria cases should be given for minimum of 24 hours once started (irrespective of the patient's ability to tolerate oral medication earlier than 24 hours).

After parenteral artemisinin therapy, patients will receive a full course of oral ACT for 3 days. Those patients who received parenteral Quinine therapy should receive:

- Oral Quinine 10 mg/kg body weight three times a day for 7 days (including the days when parenteral Quinine was administered) plus Doxycycline 100 mg once a day or Clindamycin 10 mg/kg body weight 12-hourly for 7 days (Doxycycline is contraindicated in pregnant women and children under 8 years of age).
  (or)
- Full oral course of Area-specific ACT:
  In NorthEastern states: Age-specific ACTAL for 3 days + PQ Single dose on second day
  In other states: Treat with: ACT-SP for 3 days + PQ Single dose on second day

Intravenous preparations should be preferred over intramuscular preparations. Pararental treatment should be given for minimum of 24 hours once started. in first trimester of pregnancy, parental quinine is the drug of choice. However, if quinine is not available, parenteral artemisinin derivatives are preferred.

Chemoprophylaxis

Chemoprophylaxis should be administered only in selective groups in high *P.falciparum* endemic areas. Use of personal protection measures including Insecticide Treated bed Nets (ITN) / Long Lasting

Dosage Chart for Treatment of *falciparum* Malaria with ACT-SP

	1st Day		2nd Day		3rd Day
Age group (years)	AS (250 mg)	SP (2.5 mg)	AS (250 mg)	PQ (2.5 mg)	AS 250 mg)
0-1 Pink Blister	1 (25 mg)	1 (250+12.5 mg)	1 (25 mg)	Nil	1 (25 mg)
1-4 Yellow Blister	1 (50 mg)	1 (500+25 mg) each	1 (50 mg)	1 (7.5 mg base)	1 (50 mg)
5-8 Green Blister	1 (100 mg)	1 (750 +37.5 mg) each	1 (100 mg)	2 (7.5 mg (base each)	1 (100 mg)
9-14 Red Blister	1 (150 mg)	2 (500+25 mg each)	1 (150 mg)	4 (7.5 mg base each)	1 (150 mg)
15 & Above White Blister	1 (200 mg)	2 (750+37.5 mg each)	1 (200 mg)	6 7.5 mg base each)	1 (200 mg)

Insecticidal Nets (LLIN) should be encouraged for pregnant women and other vulnerable population including travellers for longer stay. However, for longer stay of Military and Para-military forces in high *Pf* endemic areas, the practice of chemoprophylaxis should be followed wherever appropriate e.g. troops on night patrol duty and decisions of their Medical Administrative Authority should be followed.

Short term chemoprophylaxis (up to 6 weeks)

Doxycycline: 100 mg once daily for adults and 1.5 mg/kg once daily for children (contraindicated in children below 8 years). The drug should be started 2 days before travel and continued for 4 weeks after leaving the malarious area.

Note: It is not recommended for pregnant women and children less than 8 years.

Chemoprophylaxis for longer stay (more than 6 weeks)

Mefloquine: 250 mg weekly for adults and should be administered two weeks before, during and four weeks after exposure.

Note: Mefloquine is contraindicated in individuals with history of convulsions, neuropsychiatric problems and cardiac conditions. Therefore, necessary precautions should be taken and all should undergo screening before prescription of the drug.

Management of other signs & symptoms and Complications

1. *Hyperpyrexia* (Rectal Temperature above 39°C)
- Tepid sponging.
- If the temperature is 39°C or above, remove patient's clothes and cover him with towel or sheet soaked in tepid water and keep him under the fan.
- Keep patient in an air-conditioned room, if possible.
- Paracetamol: 5 mg kg/body weight parenteral administration if required.

2. *Dehydration*
- Glucose saline I.V., measure urine output, maintain slightly negative fluid balance and avoid pulmonary complications.

3. *Acute renal failure* with anuria or oliguria and black water fever
- It must be managed with proper biochemical examination of blood, serum electrolytes and ECG etc.
- Dextran with glucose saline I.V. to correct dehydration – If this fails to induce urine secretion and output remains less than 60 cc per hour, give
- Furosemide 20 mg or as required, upto 500 mg I.V. or I.M. as considered appropriate.
- Constantly keep watch on urinary output.
- If no improvement, dialysis. It should not be delayed and treating physician may take quick decision. It may require hemodialysis or peritoneal dialysis.
- Keep watch on serum creatinine, blood urea and serum potassium levels
- Alkalinize the urine if there is hemoglobinuria
- Maintain diet control and restrict protein intake to 20 to 30 gms. per day.

4. *Hyperkalemia:* Cardiac arrythmia and cardiac arrest may occur when serum potassium is 7 mol and above. Calcium charged resin (calzeocarb 225) 15 –30 gm orally 3-4 times a day, or 30 g in 100 ml of water rectally, may be given. When the potassium level is over 60 mol, 100 to 200 ml of 84 % sodium bicarbonate may be infused over three hours. Therapy with 20 units of insulin with 50 gm glucose may cause entry of extracellular potassium into the cells. I.V. calcium gluconate

Dosage Chart for Treatment of *(Vivax and falciparum)* Malaria with ACT-SP

Age	Day 1			Day 2		Day 3		Day 4 to 14
	As tablet (50 mg)	SP tablet	PQ (2.5 mg)	As tablet (50 mg)	PQ (2.5 mg)	As tablet (50 mg)	PQ (2.5 mg)	PQ (2.5 mg)
Less than 1 yr	½	½	0	½	0	½	0	0
1-4 years	1	1	1	1	1	1	1	1
5-8 years	2	1½	2	2	2	2	2	2
9-14 years	3	2	4	3	4	3	4	4
15 yrs or more	4	3	6	4	6	4	6	6

10 to 20 cc may also be given. The safest treatment is hemodialysis.

5. *Hypokalemia:* May occur with excessive diuresis after recovery in renal failure. This can be treated with 10 cc potassium chloride in 24 hours or equivalent.
6. *Pulmonary edema:* Arterial blood gases are monitored if the patient shows evidence of pneumonia, cyanosis or hyperventilation.

- prop up 45°
- give oxygen.
- keep careful watch on fluid balance.
- monitor central venous pressure.
- venesect 250 ml blood into donor bag to be used later on.
- give diuretic.

7. *Gastro Intestinal complications:*

- IV fluids.
- For vomiting: Chlorpromazine IV or IM as required.

8. *Bleeding* (pulmonary oedema or gastro intestinal complications):

- Parenteral Vit. K, dosage to be regulated depending on patient's condition.
- Fresh whole blood transfusion.

9. *Jaundice and Liver damage*

- I.V. glucose.
- Restrict fats.
- Vitamin K and Vitamin B complex supplements.
- Bed rest.

10. *Shock*

a. I.V. Plasma expanders.
b. Corticosteroids: if condition indicates, use hydrocortisone up to 100 mg 8 hourly.
c. Dopamine drip.
d. Oxygen

11. *Anaemia* (PCV< 20, Hb less than 7 gm): If associated with high parasitemia

- Whole fresh blood transfusion.
- Packed cell transfusion.
- After acute condition is controlled, use iron folic acid supplement.

12. *Convulsions:* Convulsions might occur due to hyperpyrexia, specially in children in both *P.vivax* and *P.falciparum* infections

- Diazepam (0.2 mg per kg body weight) I.M./I.V. 8 hourly dosage to be regulated by patient's response or Phenytoin Sodium 5 mg per kg. bw. slow I.V. infusion over 15-20 minutes.
- Prophylactic phenobarbitone 5-10 per kg body weight.

13. *Hypoglycaemia*

- I.V. Glucose 50% (up to 1 ml per kg body weight) Followed by 5-10% I.V drip. Keep constant watch on blood sugar levels.

14. *Hyperparasitemia* (Parasitized RBCs 10 % and above)

- Exchange transfusion.

Errors in management of severe falciparum malaria:

1) Misdiagnosis, particularly during epidemics of meningitis and encephalitis.
2) Missed microscopic confirmation.
3) Missed associated diseases /complications.
4) Missed hypoglycemia.
5) Errors of fluid/electrolyte replacement.
6) Failure to control convulsions.
7) Mismanagement of respiratory complications.

DDCs and FTDs

For strengthening early case detection and prompt treatment, 3.9 million Drug Distribution Centers (DDCs)/ Fever Treatment Depots (FTDs) /Malaria Link Volunteers (MLVs) have been established in the country till 2004. There are 0.17 million malaria clinics functioning in the country.

INSECTICIDE POLICY

Vectors of Malaria

In India malaria is transmitted by nine vector species, six are of primary importance. These are: *Anopheles culicifacies* (transmits malaria in rural and peri-urban), *A fluviatilis* (Areas in plains, In hills and foothills), *A stephensi* (in urban areas), *A minimus, A dirus* (in north eastern states), *A sundaicus,* (in Andaman and Nicobar Islands), *A annularis, A philippinensis, and A varuna.* Of these *An. culicifacies* is responsible for the transmission of 60-70% (so maximum budgetary allocation) and *An. fluviatilis* causes 15-20% new cases of malaria in India.

Vector Control

Effective vector control strategies are based on four facts:

(i) Knowledge and understanding of vector biology,
(ii) Surveillance of vector species,
(iii) Incrimination of vector species,
(iv) Public education and implementation of effective control measures.

Presently different formulations of synthetic chemical insecticides are in the use for vector control. Wettable powder (WP) formulations are used for indoor residual sprays while emulsion concentrate (EC) formulations are used for larval control. For Indoor Residual Spray (IRS) insecticides in use are DDT 50% WP, malathion 25% WP and synthetic Pyrethroid (WP). Synthetic Pyrethroids include deltamethrin 2.5% WP, Cyfluthrin 10% WP, lambdacyhalothrin 10% WP, alpha-cypermethrin 5% WP, Etofenprox 10% WP and Bifenthrin 10% WP. Synthetic pyrethroid insecticides are also used for impregnation of bed nets.

Indoor Residual Spray (IRS)

Most of the insecticides having residual effect are sprayed indoors, so that mosquitoes after having bite on an infective person will rest in the house and will pick up sufficient insecticide particles sprayed on the walls and other indoor surfaces of the house and its longevity will be reduced so much so that it does not survive to become infective. In areas where the vectors are strongly endophilic, i.e. they tend to rest indoors, indoor residual spraying of human dwellings can give very effective control. Vectors that are exophillic i.e. they tend to rest outdoor but tend to feed or rest indoors briefly, can be effectively controlled by indoor residual spraying with insecticides that have good airborne effect. In areas where vectors are strongly exophilic and/or exophagic, i.e. they rest and bite outdoors, other control methods, such as use of insecticide treated mosquito nets or exterior space spraying (for emergency control), should be considered. In practice, the effectiveness of house spraying for malaria control depends on various factors but some are as follows:

Target area: Generally, all the interior walls and ceilings are treated. In addition to permanent human dwellings, field huts where people sleep during the planting or harvesting season should be sprayed, depending on local vector behavior. The underside of furniture, back of the doors, outside caves and porch may need to be treated. It should be noted that the residual effect of insecticides may be short on some surfaces, e.g. porous mud walls, oil painted wood and alkaline white wash.

Selection of Insecticides: Several factors need to be considered in the selection of an insecticide spraying, including availability, cost, residual effectiveness, safety, vector susceptibility and excito -repellency. There are large number of insecticides, which are used as adulticides for indoor residual spray. These are DDT, Malathion and different formulations of synthetic pyrethroids. For An. Culicifacies, DDT is insecticide of choice and should be tried till resistance is detected where Malathion and pyrethroid can be used. The other main vectors of malaria i.e., *An.fluviatilis*, *An.minimus* and *An.dirus* are still susceptible to DDT. However, susceptibility status should be continuously monitored and if the tests show development of resistance coupled with loss of epidemiological impact of spray operations, alternative to DDT is Malathion and alternative to DDT+ Malathion is synthetic Pyrethroids.

Change of Insecticide: If the change of insecticide is warranted, the state govternment should support their choice of alternative insecticide by documentation of data on vector resistance studies and field observations on epidemiological impact of spray in respect of insecticide in use. The change of insecticide will always be decided in mutual consultation between State Program Officer for NVBDCP, ROH&FW and the Directorate of NVBDCP with concurrences of State and Central Governments.

Insecticide formulations used under NVBDCP

Table 11A.4 presents the doses and areas to be covered with various insecticides used under NVBDCP.

DDT (Dichloro – diphenyl – trichloroethane)

In India, DDT has been in use for malaria control since 1946. Recently there has been a tendency to curb the use of DDT due to its persistence in the environment. It is a fact that if DDT is applied in agriculture, it contaminate water resources, enters the bio-chain and at each step of the bio-chain, it gets more concentrated (bio-magnification) till it reaches human beings. In human body, it is stored in the body fat and is excreted in the milk. Therefore it reaches the infants right from the time of birth. Since DDT persists for a long time in the community, there has been apprehension that it will produce adverse impact on human metabolism and growth. However, in spite of extensive use of DDT in agriculture, no adverse reaction of DDT on human health has been reported so far. DDT may therefore be used for vector control, provided that all the following conditions are met:

a) It is used only for indoor spraying.

Table11A.4: Insecticide formulations and dosages for Indoor Residual Spray

Name of Insecticide	Preparation of suspension in water	Dosage of active ingredient per square meter	Residual effect in weeks	Area to be covered by 10 L of spray
DDT 50% wp	1 kg/10 Lit	1 gm	10-12	500 sq.m
Malathion 25% wp	2 kg/10 Lit	2 gm	6-8	250 sq.m
Deltamethrin 2.5% wp	400 gm/10 Lit	20 mg	10-12	500 sq.m
Cyfluthrin 10%wp	125 gm/10 Lit	25 mg	10-12	500 sq.m
Lambdacyhalothrin 10% wp	125 gm/10 Lit	25 mg	10-12	500 sq.m
Alphacypermethrin 5%wp	250gm/10 Lit.	25 mg	10-12	500 sq.m
Biofenthrin 10% WP	125g/10 litre	25 mg.	10-12	500 sq.m.

b) It is effective.
c) The material is manufactured to the specifications issued by WHO.
d) The necessary safety precautions are taken in its use and disposal.

Govt. of India has constituted a mandate Committee on DDT, which reviews the use of DDT in public health and decides its quantity to be released for the vector borne diseases control program every year. It is comparatively cheaper than the other insecticides and even in those areas where resistance to DDT has been recorded in studies with WHO test kits, the epidemiological impact of good spray operations is seen because of its excito-repellent action. 150 MT of DDT per million population for two rounds of spray is required. In areas where third round is proposed in selected villages, additional requirement of 75 MT per million population should be estimated.

Organophosphorus (OP) compounds

Malathion 25% WP is used under the program in areas with DDT resistance. The disadvantage of organophosphorus compounds is that unlike their use in agriculture where a farmer uses the organophosphorus compound for crop protection only once or twice a year, the spray squads engaged in spraying residual insecticide in the human dwellings work with these compounds for periods extending up to 6 or 7 months. This long exposure results in acute toxic symptoms and if not controlled properly may lead to mortality. Therefore, the spray staff engaged in spraying of organophosphorus compounds are to be provided with more elaborate protective garments and their blood cholinesterase level is to be checked periodically to assess the toxic impact of the compound. These compounds are also toxic to domestic pets. Under Indian conditions, three rounds of spray with organophosphorus compounds are given as against two rounds of spray with DDT. 900 MT of Malathion per million population for three rounds of spray are required. If in some areas a further round is required in selected villages, 300 MT per million population for the special round for the population of selected villages only.

In case of OP poisoning, the patient should be transported as soon as possible to a doctor to receive an antidote. Organophosphate poisoning, 2-4 mg of atropine should be given intravenously (for children 0.5 to 2 mg according to weight). Depending on symptoms, further doses of 2 mg should be given every 15 minutes for 2-12 hours in severe cases. Automatic injections are available for administration of atropine.

Synthetic Pyrethoids

Synthetic pyrethroids are used in case of vector resistance from DDT and Malathion. The cost of these insecticides is much higher than the cost of DDT and Malathion. Pyrethroids are preferred as mosquitoes bed net treatment because of its fast knock down effect on mosquitoes at low doses, having a more than 6 months longer residual action, low toxicity, odorless and do not stain to clothing, and effective against head lice, cockroaches, bedbugs, ants, etc. Following pyrethroids with various doses are used:

(i) Deltamethrin 2.5% WP: 60 MT per million population for two rounds of spray. In some areas, where a further round is required in selected villages, additional requirement of 30 MT per million

for the population of selected villages is estimated.

(ii) Cyfluthrin 10% WP: 18.75 MT per million population for two rounds of spray and 9.38 MT per million population for selected villages which would require special round/third round of spray.

(iii) Lambdacyhalothrin 10% WP: 18.75 MT per million population for two rounds of spray and for a special round or IIIrd round of spray in selected villages, 9.38 MT per million population may be estimated.

(iv) Alphacypermethrin 5% WP 37.5 MT per million population for two rounds of spray.

(v) Bifenthrin 10% WP : 18.75 MT per million population for two rounds of spray and 9.38 MT per million population for selected villages which would require special round/ third round of spray. In treating pyrethroid poisoning vitamin E oil preparations can be given for prolonged paraesthesia. Only in cases of definite allergic symptoms should corticosteroids be administered. On occurrence of convulsions after sever intoxication, intravenous injection of 5-10 mg Diazepam (or other benzdiazepine derivatives) should be given.

Strategies of Delay the onset of Resistance

Malaria vectors in India are resistant to DDT alone or double resistant to HCH or triple resistant to DDT, HCH, malathion and quadruple resistant to DDT, HCH, malathion and Deltamethrin (synthetic pyrethroid). HCH has been phased out of the program in 1997. The methods of management of insecticide resistance include avoidance of use of insecticide, that induce broad-spectrum resistance mechanisms and confer cross resistance to chemically related and unrelated insecticides and sequential use of insecticides in rotation are preferred. Possible ways of avoiding development of insecticide resistance in field

- Avoid indiscriminate use of insecticides
- Avoid use of insecticides that simultaneously select resistance to other chemically related insecticides.
- Avoid use of insecticides that induce development of more than one type of resistance mechanism of broad spectrum of resistance.
- Avoid use of the same insecticide both against adults and larvae.
- Use of non chemical control methods, e.g. biopesticides, larvivorous fish.
- Use of synergist with insecticides to reduce physiological resistance.

Insecticide Spray Operations

The indoor residual spray of human dwellings is as important for malaria control in the community, as is the early case detection and prompt treatment for an individual cure, therefore, it is essential that residual insecticidal spray should be planned and implemented with sound technical skill under expert guidance. It should not be entrusted to nontechnical personnel like contractors, voluntary bodies etc. In the revised approach to malaria control, it has been decided to spray human dwellings and mixed dwellings. Cattle sheds are not to be sprayed with a view to conserve insecticide, improve coverage of human dwellings and the present diversion of mosquitoes from sprayed cattle sheds to human dwellings.

Planning for Spray Operations

The planning of spray operations will be done by the District Malaria Officer. He involves the Medical Officer in-charge of the PHCs in this process. The epidemiological data should be thoroughly analyzed in this process. Under the MPO, the spray operations are to be carried out in all area with API 2 or above. However, the priority of spray will be given to High Risk areas all over the country. Therefore, in "high risk" areas the population of 'sub-center' qualifying under the criteria laid down by the expert committee is considered.

Spray Technique

The insecticides are available as wettable powders. The preparation of the spray suspension is made just before the start of the spray operations every day. It is important that the suspension is made correctly so that the correct dosage is applied on the sprayed surfaces. The procedure for the preparation of the suspension is the same irrespective of the insecticide. However, the quantity of the insecticide used per 10 liters of water will depend on the insecticide used.

The required quantity of the insecticide is measured with a plastic mug and poured into a 15 liter bucket. A paste is made with a small quantity of water. The remainder of water is then poured slowly into the bucket and the insecticide water mixture is stirred vigorously to obtain a uniform suspension. The suspension is then poured into another bucket through a cloth sieve to remove any particulate matter that might clog the nozzle of the spray pump. One man operates the pump and the other man sprays. The spray

lance should be kept 45 cms (18 inches) away from the wall surface. The swath should be parallel. Spray is applied in vertical swath of 53 cm (21 inches) wide. Successive swaths should overlap by 7.5 cm (3 inches). Spray is done from roof to floor, using downward motion, to complete one swath; then stepping sideways and spraying upwards from floor to roof. Do not let the spray drip to the floor. Spraying is done on inner surfaces including eaves and roofs. A good quality spray should lead to uniform deposit on walls and other sprayable surfaces. This is easy to verify for DDT and malathion sprays as the insecticide deposits are clearly visible. Deposits of synthetic pyrethroids are visible on wooden structures. The supervisor through physical verification should verify the quality and coverage of spray randomly.

The discharge rate should be 740 to 850 ml per minute. To obtain the above discharge rate, the pump man should give 20 to 26 strokes per minute with 10-15 cms plunger movement at a pressure of 10 PSI (0.7 kg/sq.cm) at the nozzle tip. It takes about 5 minutes to spray a house with an average surface area of 150 sq. meters.

Supervision

Supervision of spray operations is a very important activity to ensure that spray operations are carried out according to correct technical procedure, which is essential for taking corrective action, and achieve the program goals. Supervision is carried at all levels of program implementation.

Community Participation

Involvement of *Panchayats* in successful indoor residual insecticide spray is an essential aspect of the program. Panchayats /village/ local bodies/ village heads/ Block Development Officers/ *Mahila Mandals*, religious groups etc., are to be informed about the spray schedule at least before a fortnight. This advance information must be mopped up by Surveillance Workers and Malaria Inspectors so as to facilitate the villagers to extend full cooperation in getting actual spray inside of human dwelling with the objective of full coverage of targeted population.

INSECTICIDE TREATED BED NETS PROGRAM

The use of deltamethrin-impregnated mosquito nets/ insecticide treated bed nets resulted in a significant decline in malaria incidence and Annual Parasite Index (API). The average mosquito density of Anopheline mosquitoes decreased by 68% and Culex by 50%. The insecticide was found safe for use amongst troops. Use of deltamethrin impregnated mosquito nets has beneficial impact on Integrated Control of Malaria (Deswal et al 2005).

Mosquito nets are widely used by communities in many parts of the world as a measure of personal protection against mosquitoes and other biting insects. It has been found in a study that the biggest determinant of ITN use was intra-household access to them; the more nets a household has, the more likely a child in the house will use one (Eisele et al 2009) The Northeast (NE) region of India comprising seven states-Assam, Arunachal Pradesh, Manipur, Mizoram, Meghalaya, Nagaland and Tripura and the tribal predominant areas of the states of Andhra Pradesh, Gujarat, Jharkhand, Chhatisgarh, Maharashtra, Orissa, Rajasthan and Madhya Pradesh are characterized by the preponderance of stable malaria and high Pf incidence (contributing 80% of the total cases of India). This tribal population is living close to the forest and always at risk of transmission of diseases. At the same time they have strong tradition of bed net usage. In some areas where bed net is not in use can be motivated for the same. During 1999-2000, 1,50,000 insecticide treated bed nets are distributed in the NE states. During 2000-2001 the supplies are increased in more areas besides NE and 3,20,000 nets given, which is raised to 17,95,000 bed nets by 2005 (Govt. of India 2007).

Specific Objectives

- **Reduce human contact** with the vector mosquitoes.
- **Reduce morbidity** due to malaria in the selected populations, particularly vulnerable population such as tribals and people below poverty line.
- **Prevent deaths** due to malaria.
- Promote concept of **community participation** in malaria control through involvement of NGOs, faith based organizations/community based organizations/local self governments.
- Modalities for social marketing through **public-private partnership** have been initiated.

Requirement

State Program officer is directly responsible for the program and would make an assessment of community needs by rapid surveys, size of the nets and number of nets according to size. Similarly requirement of the synthetic pyrethroids mainly two Deltamethrin (2.5%) at a dosage of 25mg/m^2 and cyfluthrin (5%) at 50mg/m^2 dosage are being supplied for treatment of mosquito nets. Other insecticides, which can be used are permethrin 10% EC (Emulsifiable Concentration) in 200-500 mg/m2; Lambdacyhalothrin 2.5% EC in 25-30 mg/m2; Etofenprox 10% EW in 200 mg/m2 and alpha-cypermethrin 10% SC in 20-40 mg/m2. The same information will be communicated to the center. The optimal effectiveness of synthetic pyrethroids range 6-12 months but general 6 months is accepted for retreatment. Synthetic pyrethroid tablets formulation for individual use for impregnated and re-impregnation of community owned betnets has been introduced by the government (NVBDCP 2007).

Insecticide treatment procedure

Step 1: The surface area of net is determined by the following formula:

Surface area = 2 (a + b) + c

a = length X height

b = height X width

c = length X width

Step 2: The amount of formulation of insecticide for target dose of 25 mg/m^2 of *deltamethrin* is calculated as:

Weight required (gm) = surface area in m^2 X 0.025

Step 3: The volume of formulation required is determined by:

$$\text{Volume required} = \frac{\text{weight (gm)} \times 100}{\text{\% formulation of insecticide}} \text{ ml}$$

For example to treat a mosquito net of 10 m^2 using 2.5% formulation the volume of formulation required would be:

$$\frac{(10 \times 0.025) \times 100}{2.5} = 10\text{ml}$$

Step 4: Cold water must always be used for insecticide treatment. The absorption capacity of a net may be determine: This may be done by immersing a net in a given quantity of water and allowing the net to absorb water. The left over water should be measured. This amount should be minus with the total amount will give the absorption capacity of water of the net.

Step 5. Use the tray for mixing the water and insecticide and wear the gloves for mixing and handling.

Step 6. Always dry the net in shades. Drying should never be done under the sun.

Step 7. Never throw the left over insecticide in any water body or drinking water source. It should be poured into a specially dug hole in dry ground where it would be absorbed quickly. It can be discharged into sewage drain or latrine. Synthetic nets are better than cotton nets because they are cost effective and effect of insecticide is last longer.

There is a large population lives under malaria risk so the requirement for bednets is also enormous. This can not be achieved by government alone and private agencies must come forward to support this program (Bhagyalaxmi 2007). It is also widely recognized that social marketing of ITNs for sale at subsidized prices through the public and private sector will be needed to sustain the coverage achieved through mass free campaigns (Lengeler 2007)

OTHER ASPECTS OF NVBDCP

Central Cross Checking Organization

The officers of the directorate regularly cross checks anti-larval operation in MCD, NDMC, Railways, Defence areas as well as zoological park and President's Estate, etc. They also checks efficiency of both laboratory and field work and conducts mass fever surveys to assess the situation and recommend necessary action. Monitoring and evaluation through review meetings and surveys has been intensified.

Computerized MIS

Web based management information system has been launched from the National up to the district level. It is envisaged that MIS would facilitate regular interface with districts, early detection of epidemics and control of the same by warning the states well in advance and cross exchange of information.

Intersectoral Convergence (Public Private Partnership)

Intersectoral collaboration has been scaled up at all levels of implementation of prevention and control of malaria and other vector borne diseases. Public Private Partnership building is in the process involving NGOs/ Faith based organizations/community based organizations/ local self government, non-health sector departments (Tribal welfare, education, railways, CRPF, BSF, Armed Forces, etc.) as well as corporate sector, tea estates/tea association for delivery of services and social mobilization, especially in areas with problems of accessibility, inadequate public health care delivery system.

Following schemes are operating for PPP

1. Early diagnosis and prompt treatment: a) provision of outreach services -drug distribution center, fever treatment depot; b) provision of microscopy and treatment services; c) hospital based treatment and care of severe and complicated malaria cases;
2. Promotion of insecticide treated bednets and distribution of insecticide treated bed nets in selected areas; and
3. Indoor Residual Spraying (IRS).

Behavior Change Communication activities for social mobilization

Extensive social mobilization has been initiated through structured behavior change communication (BCC) campaign targeting care takers and care providers, political/opinion leaders/planners/resource givers/media for prevention and control of vector borne diseases (early case diagnosis/reporting, prompt and complete treatment, drug/dosage compliance, identification and referral of severe cases, home based morbidity management, outbreak/emergency preparedness and integrated vector management.

Objectives

1. Enhancing awareness;
2. Promoting attitudinal and value changes among target audiences leading to informed decisions, modified behavior, desirable practices;
3. Building support for the program across intersectors of society and health care service providers (public/private) and eliciting commitment for action;
4. Stimulating increased and sustained demand for quality prevention and care services;
5. Ensuring availability of services; and
6. Improving quality of life and social and economic conditions.

The BCC campaign is being implemented through four pronged activities: advocacy workshops, intersectoral meetings, program implementation and monitoring and evaluation.

Capacity Building

Integrated trainers' training of the medical college faculty on vector borne diseases at tertiary level has been started to strengthen health care delivery system; ensure the quality of health manpower development; improve referral services for appropriate management of severe and complicated cases; provide technical support in outbreak investigations; and own up national program strategies. Capacity building of the private practitioners is also being pursued in active collaboration with Indian Medical Association.

Operation Research and Assessments

Need based operation research initiatives are conducted in sustained collaboration with state program managers, ICMR, and other research organizations.

MALARIA EPIDEMICS: PREDICTION, PREPAREDNESS AND CONTROL

The outbreak of the malaria epidemic inflicts heavy losses of man- days and economic losses besides mortality. Therefore the priority is to be accorded for prevention of its occurrence. The aim of public health personnel should be in first place to detect in time or perceive the impending epidemics and then make all efforts to prevent its outbreak.

Seasonal Variation versus Outbreak: Diagnosis of the problem

Malaria epidemics are usually the result of:

- Major changes in the eco-epidemiological system like excess rainfall, pushing the area towards a new equilibrium of higher endemicity.
- Premature termination or unplanned interruption of anti malarial measures, which had previously controlled areas with all epidemiological characteristics of high endemicity. These epidemics are real resurgences arising from failures of control.

- Less effective implementation of control measures.

Malaria shows very clear seasonal variation in any given year. The incidence increases during and following the monsoon rains. This variation would not be labeled as an outbreak. The incidence during any part of the year should be compared to the situation in the previous year/ years to demonstrate clear increase to be declared as an epidemic.

Early detection of epidemic situations requires a definition of normality. The most practical method is the determination of epidemic indices by plotting the median or merely the numbers of malaria cases and third quartile of malaria incidence every calendar month of previous years. This defines a normal range on which to plot the current data in order to detect an abnormal increase. At least few health facilities in epidemic prone areas should adopt this method of epidemiological analysis.

The malaria incidence of the current month should be compared with the incidence during the same month of preceding year(s). For example, the incidence of July 2006 should be compared with the incidence of July 2005 and so on. The second determinant is the "trend" of malaria incidence in the area during the year under investigation i.e. month-wise malaria incidence, trends for two consecutive years are compared. In this case any unusual increase or decrease in malaria incidence over a period of time is analyzed.

For timely detection and remedial measures to prevent and control the malaria epidemic outbreak, the PHC medical officer should analyze the data in MF-9 (villagewise register of the PHC). By doing so he cannot miss any unusual change in malaria incidence in the community / villages vis-a-vis the number of fever cases from the same area reporting to PHC OPD. This is one of important steps to be taken by the PHC in analyzing the malaria situation for monitoring an epidemic build up. Other sources of information are: a) rise in malaria positivity rate in the laboratory examination, b) rising fever incidence reported by i) FTD holder /MPW, ii) community leaders, iii) Press, iv) legislature and v) medical practitioners of the area.

Such reports should be carefully assessed along with laboratory positivity rate of the area. If the positivity rate is high, it is likely to be the beginning of malaria epidemic in the area and requires immediate careful investigation.

Epidemic preparedness

In epidemic prone areas, it is essential that a close collaboration be established between the specialized antimalarial services and emergency preparedness teams.

The prediction of malaria epidemics is of vital importance, since this enables the public health authorities to mobilize the resources timely and initiate suitable preventive and containment measures in the area so that the situation is brought under control early. For this certain factors or signals are to be watched, usually in combination, which are as follows:

1) Climatic factors: The climatic conditions have a profound effect on the life cycle and longevity of vector mosquito and also on the development of the malaria parasite. The important climatic factors are:

- **Temperature and Relative Humidity (RH) –** the optimum for development of malaria parasite is between 25^0 C To 30^0 C, and average RH at least 60%. These temperature and RH conditions increase the longevity of mosquitoes and thus aid malaria transmission.
- **Rainfall-** Increased rainfall specially rainy days result in mosquitogenic conditions. Pre-monsoon rains, which maintain temperatures between 25-30 C and relative humidity around 80% for longer duration, lead to increase vector density and longevity to initiate malaria transmission, if parasite load exists in the community.
- **Natural calamities-** The natural calamities/ disasters like flood, drought and earthquake, usually cause increase in mosquitogenic conditions resulting in outbreak of malaria epidemic.

2) Vulnerability: Some of the important points of vulnerability of an area are as follows:

- In urban slums, an increase in mosquitogenic conditions (especially mosquito breeding) due to increased houses, water storage, and poor drainage; rapid uncontrolled growth of cities; irrigation projects; agricultural development.
- Change in bionomics and behavior of vector/s with special reference to change in resting and feeding habits, and response to insecticides.

- Deforestation.
- Increase in breeding and density of vector.
- Increase in the degree of man- mosquito contact.

3) Parasite factors:
- Increasing trend of fever cases and SPR (Slide positivity rate),
- Increasing in proportion of gametocytes in the community
- Increase in Pf proportion;
- Resistance in parasite to drug/s
- Increase in malaria mortality; and
- Increase in consumption of anti- malarials

4) Operational factors: Inadequate basic health services may contribute heavily to outbreak of malaria epidemic in the area, particularly the following points:
  - Staff vacancy,
  - Poor surveillance machinery,
  - Lack of adequate transport facilities,
  - Lack of approach road to far flung areas,
  - Inadequacy in material and equipment,
  - Inadequate training and lack of motivation of staff.

Detecting a malaria epidemic

Step-I: On the basis of above mentioned signals or factors, which may be in combination, the occurrence of an epidemic of malaria can be predicted. The clue for proceeding in this direction may be taken from the following:
- Increase in fever rate reaching to one third or more of new OPD cases in dispensaries, PHC or hospitals during the current months.
- Increased fever incidence in the population as reported/ informed by the field staff, community health guides/ volunteers, DDC and FTD holders or Panchayat members, etc.
- Increase in the incidence if malaria in the current months as compared to those of preceding year(s).

Step-II: In case these indicators are there, following steps are further taken:
- Carry out rapid fever survey (RFS) in the area to collect and examine blood smears, with the objective the finding out slide positivity rate (SPR) to understand the quantum of disease in the community.
- Compare the SPR of RFS (as above) and current months, with that of the same months of the previous years (s).
- Collect the data and information on the signals related to climatic factors, vulnerability, receptivity, and operational status. etc. and scrutinize them to note specific points of abnormality / increase, etc.

Epidemic Response

The recognition of an alarm signal of an impending epidemic should be followed by the implementation measures, which consist of strengthening of diagnostic and treatment facilities and initiation of vector control measures.

The actions suggested are:
- Carry out fever survey in the affected areas specially those with surveillance blackout or poor surveillance (as would be seen from MF-9 register) by collecting blood slide and giving presumptive treatment, and delineate areas;
- Strengthen the treatment facilities at health institutions by providing antimalarial and supportive medicines; review of the laboratory functions.
- Interrupt the transmission by undertaking indoor residual spraying (IRS) with suitable insecticide(s). In case regular spraying is not possible, focal spraying may be carried out.
- Activate DDC & FTD specially where surveillance is weak.
- Ensure providing complete radical treatment to all positive cases with suitable drug(s).
- Intensify IEC to increase awareness about malaria & its control and motivate community to adopt preventive measures for vector control & protect themselves from mosquito bite.
- In case of water logging etc. the district administration may be approached to ensure drainage of the area immediately, taking help of concerned departments, since water standing beyond 7 to 10 days is likely to provide vector mosquito breeding.
- Close entomological monitoring may be done to assess the impact of intervention measures and vector bionomics (e.g. density, resting, feeding, breeding etc.).

As a rapid response to prevent the impending epidemic of malaria the district must develop the following two essential components:

A. District mobile malaria epidemic control team (DMECT)

A facility should be created for a DMECT from the exiting resources, to be pressed into service as and when required during epidemics. This team in each district may be constituted as follows, in addition to the personnel for routine anti- malaria activities:

1.	Medial Officer	-1
2.	Lab. Technician	-2
3.	Spray men	-5
4.	Insect Collector	-2
5.	Driver	-1

In the event of an epidemic, when the district mobile team is pressed into action, the zonal entomologist should be associated with the team and he may supervise entomological activity being done by the two insect collectors and collate entomological data with epidemiological data.

The State Program Officer may decide to provide additional input depending on the magnitude of the problem in addition to the district mobile malaria epidemic control team mentioned above.

B. Logistics support

Emergency supply, as buffer stock of insecticides, drugs, equipment and vehicle may be as follows:

I.	Vehicle (jeep)	-	1
II.	Microscopes	-	2
III	Spray pumps (HC or stirrup)	-	5
IV.	Automiser (or flit pump)	-	5
V.	Insecticides		
VI.	Drugs		
VII	Laboratory chemicals like stains, glassware, etc.		
VIII.	Contingent items like pricking needles, spirit, cotton, slide box, stationery, etc.		

Note: for V), VI), VII), and VIII) 1% of total requirement of district.

Epidemiological, entomological and weather data and information on population movement are required which may indicate seasonal epidemiological pattern, vector prevalence and response to insecticide in hand and mosquitogenic and malariogenic potential. In case the outbreak of epidemic has taken place, top priority is to be given to control it. For this important guiding points are as follows:

- Establish a control cell (or room) at district for monitoring and sending information to state and national level
- District mobile malaria epidemic control team to reach the area immediately with the available material & equipment and manpower; District Malaria Officer & MO, PHC should also reach;
- Check and update the logistics and manpower; if need supplement and put indent for additional;
- Delineate the affected areas roughly and also include additional and adjoining areas. For this, rapid fever survey is to be done. Such a survey is to commence from the epicenter and the areas of coverage to be increased centrifugally till one reaches areas with normal malaria positivity rate (and also fever rate);
- During survey it may ensured that:
  - All age groups are covered with special attention to children, pregnant women & migrants; and
  - All fever cases are given presumptive treatment.
- Investigate death cases (to confirm whether death has taken place due to malaria / otherwise)
- Establish a field laboratory simultaneously;
- Declare malaria as notifiable especially from the private sector. All malaria cases coming to private medical institutions and medical practitioners must be given full treatment and notified;
- Fever Radical Treatment (FRT) to be deployed specially in rural areas. Mass Radical Treatment (MRT) may be resorted to only in highly malarious villages with high mortality;
- Vector control measures to be started as soon as possible , after the areas are identified;
- Submit regular information on daily / weekly basis to all concerned at the state & national level. The information may include epidemiological data, investigation reports of death due to malaria, vector control measures during taken

Methodology of Emergency Vector Control Measures:

Rural Areas

- Space spray with pyrethrum extract to knock down infected mosquitoes in highly affected villages; this is to be carried out for 7-10 consecutive days or till the indoor Residual Spray (IRS) is taken up;
- Indoor Residual Spray (IRS) with suitable

insecticide in all the roofed structures;
- As an alternative, fogging (ULV) with malathion may be resorted to, specially when vector is exophilic;
- Wherever feasible, anti larval measures may be supplemented to IRS. Alternative measures like use of impregnated mosquito nets & taking environmental measures for vector control may be adopted.
- Entomological investigation on vector density & breeding and vector response to insecticide being used, to be carried out

Urban Areas
- Pyrethrum space spray in about 50 houses in and around a malaria positive house to be carried out;
- Anti larval measures must be intensified;
- IRS must be undertaken in periphery and slum areas.

Post epidemic action

Documentation and reporting of the epidemic along with the control measures undertaken is an important step. It is essential to determine:
- What deficiencies predicted the prediction of the epidemic or hindered the implementation of preventive measures;
- What problems, if any, affected early detection, confirmation of an epidemic or timely response;

What indicators should be monitored in order to improve the detection of epidemic risk.

REMOTE SENSING

Remote Sensing (RS) technology is a tool for the surveillance of habitats, densities of vector species and even prediction of the incidence of diseases that must be considered as new invention in the epidemiology of malaria and vector-borne diseases. Literal meaning of remote sensing is to sense any object from a distance. The human eyes and cameras also act as remote sensing devices. However, scientist of National Aeronautics and Space Administration (NASA) of USA used color infrared aerial photography to identify the habitats of a nuisance mosquito, Aedes solicitans in 1971. The principle of RS rests on the fact that every object absorbs some part of radiation received from sunlight. Depending upon its physical and chemical properties, the object absorbs some part of radiation while the remaining part is reflected in specific wavelength of the electromagnetic spectrum (EMS). This reflected energy is channelized through a telescope to detectors/sensors present on board of the satellites. The sensors are sensitive to different bands of EMS. The sensors convert the light energy into electrical voltages produces two-dimensional discrete pictures. These are different for different objects and the satellite pass over a particular part of earth at the fixed time intervals repeatedly making it possible to monitor changes in the land use categories viz. water bodies, vegetation, human settlements, etc.

Remote sensing has application in urban development, road network, forests, soil mapping, geology, crop estimation, detection of fire in forest, mines, oil sleek in sea, etc. Such data is generated in National Remote Sensing Agency, Hyderabad, in India. A feasibility study using Satellite data in collaboration with the Indian Space Research Organization in and around Delhi was carried out and correlation of changes in the areas of land use features viz. water bodies and vegetations with mosquito density was found significant in some sites.

Remote Sensing is likely to become a rapid epidemiological tool for surveillance of vector-borne diseases and malaria in particular. Coupled with Geographical Information System (GIS), statistical analysis, sound knowledge of ecology of mosquito vector populations, improved remote sensing will play a key role in the macrostratification of vast malarious areas for prioritizing the control measures in a cost effective way (ICMR 2000). Beside surveillance data on endemic disease distribution in an area provide by geographic information systems can be used to assess the nature of disease threats to displaced people and enable public health action, such as immunization, to be taken to protect groups at risk. These types of data may also be used evaluate the evolution of eventual outbreaks or epidemics, and to adapt disease control strategies.

COMMENTS

1. *Adequacy of Program:* The program was never designed in a comprehensive manner. From time to time problem areas were identified and new strategy was planned, such as Urban Malaria Scheme, Modified Plan of Operation, Malaria Action Program, Enhanced Malaria project, Anti-Malaria Program and now Vector Borne Diseases

Control which is operating under National Rural Health Mission. Comprehensive interventions are available and are cost effective. For which a good leadership and team work is required.

2. *Tribal Malaria:* The constant movement of tribal people in forests make it difficult to treat individuals and the malaria gametocytes load remains high. Many antimosquito measures are not used in tribal areas. Their knowledge about disease and transmission is also poor. Faith in traditional healers is hindering them to get treatment on time and receive adulterated or inadequate dose treatment. Injection treatment is also preferred in tribals for fever. They believe that convulsion is due to evil spirits which hinder them to get antimalarial drugs (ICMR 2004). More emphasize on tribal malaria is required in the program.
3. *Change in program terminology:* Many a time the name of the program was changed, which may have adverse impact on the implementation at grassroot level.
4. *Environmental Sanitation:* Main cause of malaria can be removed by improving the environmental sanitation which is not emphasized adequately till date. In this case role of other department like environment, civil, engineering, land & building, space and agriculture need to be adequately emphasized.
3. *Political Will:* There is hardly any political will to eradicate the disease. People have lost faith on government machinery. Private industries have taken the lead role in exploiting the situation and promoting costly items which have limited role in mitigation of problem at the national level. Sale of repellents has increased many fold and no one know the health implication on its long term use. To utilize the private and public potential the government should implement a comprehensive strategy for control.
5. *Community Participation:* Lack of community involvement is an important hinderance in achieving the malaria control. The problem of mosquitos as perceived by people remain same even after huge investment. The awareness level about malaria and mosquito breeding of the urban slum dwellers is not universal and need to be improved through health education in the form of posters and pamphlets distribution (Kishore et al 2004, 2008).
6. *Malaria Diagnosis:* Every fever is treated as malaria and in majority of cases unnecessary use of antimalarial drugs and side effects resulted from chloroquine use could be the another reason for noncompliance of malaria treatment leading to increase in resistance cases. New rapid malaria tests can expand access to accurate diagnosis and treatment. Initiatives undertaken in program to provide rapid test in high risk areas are good and should be sustained.
7. *Development of Anti-malarial Drug resistance:* Resistance to all anti-microbial drugs has been reported. Quinolines like chloroquine are weak bases and concentrate in the food vacuoles of parasites. Parasite is protected in presence of haem demerization which is inhibited by Quinoline. But over the period falciparum parasite has developmed point mutation in pfCRT gene at 76 position responsible for transport of parasite vacuoles (Djimbe 2001, White 2004). Due to this mutation chloroquine is expelled at higher rate from the parasites vacuoles (Foley et al 2001). Another point mutation at pfMDR1 is also implicated in determining resistance in vitro (Dorsey et al 2001).

   Resistance can be controlled by following methods:
   a) Artemisinin based combination therapy
   b) WARN- World Antimalarial Resistance Network a network to combat antimalarial resistance.
   c) Anti-malarial Resistance Database in India.
   d) Newer anti-malarial and newer approaches.
   e) Drug resistance reverse anti-hypertensive drug verapamil and anti-depression drug like Desoramine can reverse the plasmodium falciparum resistance (Rosanthak PJ 2003).
8. *Treatment:* Treatment in both the public and private sectors is hampered by low quality of care, inefficiency in service delivery and low utilization of adequate care. Demand is influenced by prices (including travel and time costs of seeking treatment), income, lack of information about appropriate treatment and the difficulties patients have in assessing treatment quality. Supply is affected by inadequate resources, poorly trained staff and inadequate incentives for health workers. Improving malaria case management will require measures to strengthen the health system as a whole (Hanson 2004). To improve the treatment

following initiatives must be started:

- Giving care seekers better information about appropriate treatment, including the importance of early treatment with an effective drug, using appropriate regimen.
- Recognizing the problems with workers and providing appropriate incentives, and supervision, etc.
- Involving private providers in the design and implementation of interventions.
- Simplifying the process of dispensing and using drugs, e.g., by pre-packing drugs.

9. *Health Delivery System:* MPWs are responsible for malaria work in rural areas but unfortunately large number of vacancies in most of the states are real bottleneck in effective implementation. Following initiatives to improve health care delivery should be started:
   - Increasing the availability of effective antimalarial drug in public health facilities.
   - Addressing the problems of quality from the user's perspective, including the attitude of staff and availability of drugs.
   - Identifying ways to improve the accessibility of health services to the population, since malaria can progress very rapidly to severe or fatal disease, and many children die before they reach a health facilities particularly in tribal and remote areas.
   - Addressing the weak incentives facing health workers, such as low salaries and poor supervision, which can undermine their motivation.
   - Improving information and management system, for example, to ensure the continuity of antimalarial drug supply and early detection of epidemics.
   - Improving the capacity to use economic analysis in decision making.
10. *Malaria Surveillance:* not happening in majority of states because of shortage of Health Worker (Male) who used to carried out malaria activities in the community.
11. *Research:*
    a) The research in malaria should be more applied and should determine cost effectiveness. Application of insecticide should be done judiciously. It is also found that application of Deltamethrin to livestock like domestic animals was not only cost effective but also it can reduce the incidence of falciparum to 56% and vivax to 31% in the community (Rowland 2001).
    b) There is a need to involve social scientists to conduct ethnological field work and to deliver better comprehensive care because they can understand health-related behavior needed for malaria control and prevention (Williams et al 2002).
    c) A new gene SMI has been created which inhibits the development of the single-celled plasmodium in the mosquitos gut. The gene is integrated with genome of Anopheles stephensi mosquito and shown results of 80% reduction of transmission of the disease in mice. The human experiment trial is to be done to prove worth for human population.
    d) Epidemic surveillance and drug resistance monitoring should be established by the government.
12. *Trained Manpower:* In-service training of malaria workers improves their malaria management skills. Such training is not regular features in most of the states and need to be strengthened as experienced in Delhi (Kishore et al 2004, 2008).
13. *Social and Ethical Issue:* Tribal community in Bihar and Orissa do not have faith in government health system. They do not allow health worker to do peripheral smear due to their belief that blood should not go waste by any mean. Their ignorance and faith in local doctors play role in failure of control of malaria in tribals.
14. Use of bednets should be promoted by social marketing and may be introduced in Rural Health Mission/RCH program for delivery of bed nets. That will also help in raising awareness of malaria if malaria is included in Integrated Management of Neonatal & Childhood Illness algorithm. Another important strategy is to bring private sector in bednets marketing. Private sector must come forward for marketing bednets in high risk areas.

WHO GLOBAL MALARIA CONTROL STRATEGY

This strategy, adopted by the World Health Assembly in May 2015, was the result of an extensive

consultative process involving 400 malaria experts from more than 70 countries. It sets ambitious but attainable goals aimed at dramatically lowering the global malaria burden in the next 15 years. They include:

1. Reducing malaria case incidence by at least 90%
2. Reducing malaria by at least 90%
3. Eliminate malaria in at least 35 countries
4. Preventing the re-establishment of malaria in all countries that area malaria free.

To address remaining challenges, the World Health Assembly adopted in 2015 the Global Technical Strategy for Malaria 2015-2030 (GTS), a 15-year blueprint for malaria control and elimination. This WHO-led strategy is complemented by the advocacy plan Action and Investment to Defeat Malaria 2016-2030 (AIM), developed by the Roll Back Malaria Partnership. Both documents share the same timeline as the 2030 Sustainable Development Goals.

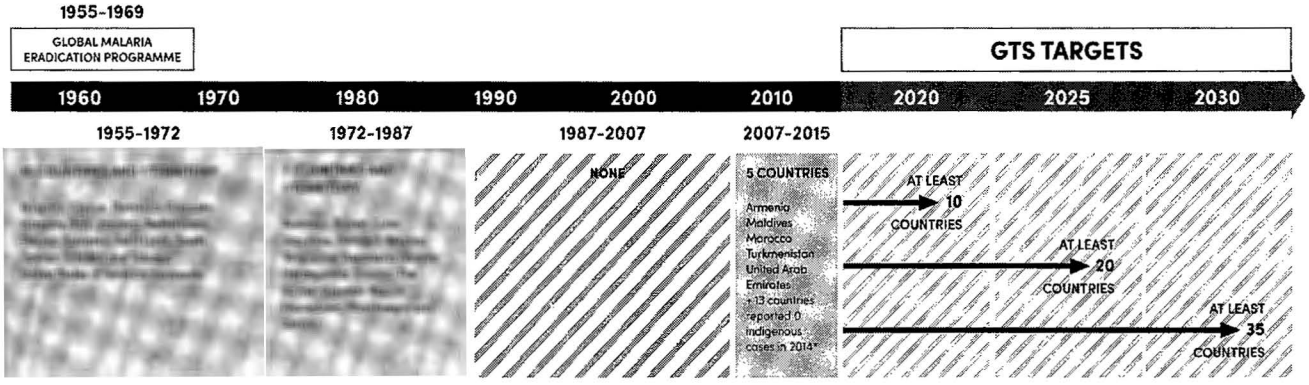
The objectives of the Global Technical Strategy can be achieved only through robust, predictable and long-term financing: global investment will need to triple from current levels, reaching an estimated US$ 8.7 billion annually by 2030. Progress can be accelerated through strong and sustained political commitment, increased multi-sectoral collaboration and continued investment in the development of new malaria control tools.

MALARIA VACCINE

In some part of the world the burden of death and disease from Plasmodium falciparum malaria is severe. To date, there are no approved vaccines to help reduce this burden, although a number of candidate vaccines have been put forward. The majority of the candidates target the pre-erythrocytic circumsporozoite protein (CSP) and the merozoite proteins Merozoite Surface Protein 1 (MSP1) and Apical Membrane Antigen 1 (AMA1)(Girard et al 2007). The RTS,S candidate vaccine has shown efficacy in infants and children. The MSP1 and AMA1 candidate vaccines are in early stage clinical development and efficacy trials will provide information to determine whether these antigens are suitable targets, and whether they can be deployed singly or as components of a multivalent malaria vaccine.

Following an infected mosquito bite, P. falciparum sporozoites migrate to hepatocytes, each developing over a period of a week to release several thousand merozoites. These initiate cyclical asexual blood stage development, producing merozoites that invade erythrocytes. AMA1 is an integral membrane protein of merozoites and sporozoites and has a central role in parasite invasion of erythrocytes and potentially hepatocytes that can be inhibited by anti-AMA1 antibody. In merozoites, AMA1 is synthesized as an 83 kDa molecule originally localized to the microneme. Around the time of merozoite release and the subsequent rapid erythrocyte invasion, the protein is N-terminally cleaved to a 66 kDa form. This translocates to the merozoite surface and undergoes secondary proteolytic processing, shedding soluble fragments (44 or 48 kDa).

Immunization with AMA1 can provide protection against infection in experimental animal models, and can induce antibodies that show functionality in in-vitro growth inhibition assays (GIA). However, AMA1



is polymorphic and immune responses have varying degrees of strain specificity and growth inhibition. Previous Phase I trials have shown that growth inhibitory antibodies can be induced by immunization with PfAMA1, but immunogenicity varied depending on the vaccine formulation.

In particular, the choice of adjuvant has a major effect on the safety, stability, immunogenicity and, presumably, eventual efficacy of a vaccine. Adjuvants can be tools that channel the immune response to generate high levels of the desired type of long-lived immunity. AlhydrogelTM, an aluminum salt, is the most widely used adjuvant in licensed human vaccines and is therefore used as a standard to compare other adjuvants. Unfortunately, in combination with malaria antigens, it has generally induced poor responses. Montanide ISA 720, a squalene based water-in-oil adjuvant formulation has shown promising results in previous malaria vaccine trials, possibly due to the slow-release capacity of the inert water-in-oil emulsion and immune stimulating effects of its components. AS02, a proprietary Adjuvant System from GlaxoSmithKline Biologicals based on an oil-in-water formulation, contains 50 mg each of the immunostimulants monophosphoryl lipid A (MPL) and Quillaja saponaria 21 (QS21). It has been used to adjuvant the RTS,S malaria candidate vaccine that targets CSP. To date, this candidate is the only malaria vaccine that has induced protection in adults, children and infants in natural field trials (Heppner et al. 2005, Alonso et al. 2005, Aponte et al. 2007, Bojang et al. 2001). These vaccines when used with adjuvants delivery system such as AlhydrogelTM, AS02, and Montanide ISA 720 are safe and capable of eliciting high antibody titers along with strong cell-mediated immunity in a phase Ia trial (Meta et al 2008).

The first ever wodescale trial of the candidate vaccine RTS, S prevented clinical malaria in 56% of 5-17 months old children and prevented 47% of severe malaria after 3 doses. The trial was conducted in 11 sites in Sub-saharan Africa on 6000 children and observed over 12 months following vaccination. But the vaccine will be available by the end of 2014 (N Engl J Med 2011 Oct).

References

Alonso PL, Sacarlal J, Aponte JJ, Leach A, Macete E, et al. (2005) Duration of protection with RTS,S/AS02A malaria vaccine in prevention of Plasmodium falciparum disease in Mozambican children: single-blind extended follow-up of a randomised controlled trial. Lancet 366: 2012–2018.

Akhivan D et al. Cost effective malaria control in Brazil: Cost-effectiveness of a malaria control program in the Amazon Basin of Brazil 1988-1996. Social Science and Medicine 1999; 49:1385-1399.

Aponte JJ, Aide P, Renom M, Mandomando I, Bassat Q, et al. (2007) Safety of the RTS,S/AS02D candidate malaria vaccine in infants living in a highly endemic area of Mozambique: a double blind randomised controlled phase I/ IIb trial. Lancet 370: 1543–1551.

Arora U, et al. Emergence of Drug Resistance in India. JIMA 2008; 106 (10): 678-683.

Bhagyalaxmi A. Role of Insecticide treated Bednets in Control of Malaria. Ind Practitioners 2007; 60 (1): 39-41.

Bouwman H, et al. Level of DDT and metabolites from Kwa0Zulu mothers after DDT application for malaria control. Bul of the WHO 1990; 68: 761-768.

Bojang KA, Milligan PJ, Pinder M, Vigneron L, Alloueche A, et al. (2001) Efficacy of RTS,S/AS02 malaria vaccine against Plasmodium falciparum infection in semi-immune adult men in The Gambia: a randomised trial. Lancet 358: 1927–1934.

Deswal BS, Bhatnagar D, Tilak R, Basannar DR. Malaria Control Using Deltamethrin Impregnated Mosquito Nets/Insecticide Treated Bednets: Experience in Armed Force. J Commun Dis 2005; 37 (4): 297-300.

Dev V, et al. High risk areas of malaria and prioritizing intervention in Assam. Curr Sci 2006; 90:32-6.

Djimbe A et al. Lancet 2001; 358: 890-1.

Dorsey et al. J Infec Disease 2001; 180: 1417-20.

Eisele TP, Keating J, Littrell M, Larsen D, Macintyre K. Assessment of insecticide-treated bednet use among children and pregnant women across 15 countries using standardized national surveys. Am J Trop Med Hyg 2009; 80: 209–214).

Foley M, Tilley M. Intl J parasitol 1997; 27: 231-40.

Girard MP, Reed ZH, Friede M, Kieny MP. A review of human vaccine research and development: malaria. Vaccine 2007; 25: 1567–1580.

Genton B, D'Acremont V, Rare L, Baea K, Reeder JC, et al. (2008) *Plasmodium vivax* and mixed infections are associated with severe malaria in children: A prospective cohort study from Papua New Guinea. PLoS Med 5: e127. doi:10.1371/journal.pmed.0050127

Govt. of India.http://www.namp.gov.in

Govt. of India. Annual Report 2010-2011. Ministry of Health & Family Welfare. Nirman Bhawan New Delhi 2007.

Govt. of India. The Use of Insecticide treated bed nets in the community. Directorate of NAMP, NICD, New Delhi 54.

Govt. of India. National Malaria Eradication Program. Epidemiology and Control of Malaria in India. NICD, Ministry of Health and Family Welfare 1996.

Govt. of India. National Drug Policy on Malaria. National Institute of Communicable Diseases, Ministry of Health & Family Welfare, Govt. of India 2008.

Graves PM. Comparison of the cost-effectiveness of permethrin impregnated bednets for the prevention of malaria. Annals of Tropical Medicine and Parasitology 1998; 92(4): 399-410.

Hanson K, Goodman C, Lines J, Meek S, Bradley D, Mills A. The Economics of Malaria Control Interventions. Global

Forum for Health Research c/o WHO Geneva 2004.
Heppner DG Jr, Kester KE, Ockenhouse CF, Tornieporth N, Ofori O, et al. (2005) Towards an RTS,S-based, multi-stage, multi-antigen vaccine against falciparum malaria: progress at the Walter Reed Army Institute of Research. Vaccine 23: 2243–2250.
http://www.nvbdcp.gov.in
ICMR. Remote Sensing: A visionary Tool in Malaria Epidemiology. ICMR Bul 2000; 30 (11).
ICMR. Tribal Malaria. ICMR Bull 2004; 34(1): 1-10.
Kishore J, VK Gupta, SV Singh, S Garg, GK Ingle. Improvement of Malaria Management in Slum of Delhi J Com Disease 2008;
Lengeler C, deSavigny D. Programme diversity is key to the success of insecticide-treated bednets. Lancet 370: 1009–1010; Eisele TP, Steketee RW (2009) Distribution of insecticide treated nets in rural Africa. BMJ 2007; 339: b1598)
Meta Roestenberg, Ed Remarque, Erik de Jonge, Rob Hermsen, Hildur Blythman, Odile Leroy, et al. Safety and Immunogenicity of a Recombinant Plasmodium falciparum AMA1 Malaria Vaccine Adjuvanted with AlhydrogelTM, Montanide ISA 720 or AS02. PLoS 2008; 3 (Issue 12): e3960 (www.plosone.org).
Pardal MPS, et al. Malaria in Assam: A challenge. Ind J Com Med 2009; 34: 94-96.
Patra et al. Malaria related morbidity in central reserve police force personnel located in the North Eastern States of India. I Human Ecol 2004; 15: 255-9.
Picard J et al. A malaria control trial using insecticide-treated bed nets and targeted chemoprophylaxis in a rural area of Gambia, West Africa. 8. Cost-effectiveness of bednets impregnated alone or combined with chemoprophylaxis in preventing mortality and morbidity from malaria in Gambian children. Transactions of the Royal Society of Tropical Medicine and Hygiene 1993; 2 : 53-57.
Picard J, Mills A, Greenwood B. The cost effectiveness of chemoprophylaxis with Maloprim administered by primary health care workers in preventing death from malaria amongst rural Gambian children aged less than five year old. Transactions of the Royal Society of Tropical Medicine and Hygiene 1992; 86 (6): 580-581.
Rogerson SJ, Carter R. Severe Vivax Malaria: Newly Recognised or Rediscovered? PloS Med 5(6): e136. doi:10.1371/journal.pmed.0050136
Rosanthal PJ. J exp Biol 2003; 206: 3735-44.
Rowland D. Control of Malaria in Pakistan by applying deltamethrin insecticide to cattle: a community randomized trial. The Lancet 2001; 357:1837-41.
Schultz LJ et al. Evaluation of maternal practices, efficacy, and cost effectiveness of alternative antimalarial regimens for use of pregnancy: Chloroquine and sulfadoxine-pyrimethamine. American Journal of Tropical Medicine and Hygiene 1996; 55 (1 Sup): 87-94.
Sharma RS, et al. Epidemiology and control of malaria in India. NMEP, Govt. of India, New Delhi 1996.
Tjitra E, Anstey NM, Sugiarto P, Warikar N, Kenangalem E, et al. (2008) Multidrugresistant*Plasmodium vivax* associated with severe and fatal malaria: A prospective study in Papua, Indonesia. PLoS Med 5: e128. doi:10.1371/journal.pmed.0050128
White NJ. J Clin Invest 2004; 113: 1084-92.
WHO. http://www.rbm.who.int for further information on RBM.
WHO. Roll Back Malaria: A Global partnership. Geneva: WHO 1998 (RBM/draft/1).
WHO. World Expert Committee On Malaria (20th Report). TRS 892, Geneva, 2000: WHO.
WHO. Environmental Management of vector control. Technical report series No. 649; 1980.
WHO. The clinical management of acute malaria 1990. WHO regional publications, South-East Asia Series No.9
WHO. The use of Antimalarial drugs 2000. Report of a informal consultation. WHO/CDS/RBM/2001, 33.
Williams HA, Jones C, Alilio M et al. Contribution of social science research to malaria prevention and control. Bull WHO 2002; 80: 251-252.
Wolff MS, el al. Blood levels of organochlorine residues and risk of breast cancer. Journal of National Cancer Institute 1993; 85: 648-652.

11B. KALA-AZAR

INTRODUCTION

Kala-azar or visceral leishmaniasis (VL) is a chronic disease caused by an intracellular protozoan (Leishmania species) and transmitted to man by bite of infected female phlebotomus sand fly. The classical features of Kala-azar are fever, splenomegaly and hepatomegaly associated with anaemia, weight loss and weakness. Fever is of gradual or sudden onset; it could be persistent or irregular, often with two daily peaks, with alternating periods of apyrexia and low-grade fever. Post kala-azar dermal Leishmaniasis (PKDL) lesions may occur after the apparent cure of systemic disease. L. donovani invades skin cells resides, develops there and manifests as dermal lesions. If untreated it may be fatal. Darkening of face, hand, feet and abdomen skin is common in India so its name is derived from locality (Kala-azar i.e. black sickness). It has a long history and it was quite common in eastern part of India mainly West Bengal, Bihar, Assam, Uttar Pradesh, and coastal regions of Tamil Nadu, and Andhra Pradesh.

EPIDEMIOLOGY

World: Visceral leishmaniasis occurs throughout the world particularly in South America, South Africa, Mediterranean countries, India and China. The overall

prevalence is 12 million cases and estimated population at risk is about 350 million. Around 115 million population is living in South Eastern region particularly in Nepal, Bangladesh, and India. Incidence of the disease is 6 lac cases every year estimated. Due to the wide spread use of DDT insecticide for control of malaria in 1950s and 1960s, transmission of VL was interrupted and the disease virtually disappeared.

India: Currently, it is a main problem in 32 districts in Bihar, 4 districts in Jharkhand, 11 districts in West Bengal and 5 districts of Uttar Pradesh. After its resurgence in Bihar in 1992 the disease has spread to adjoining areas. However, disease remains active in the region (Table 11B.1). An estimated 129 million population is expected to be at the risk of Kala-azar in the endemic districts of 4 states.

Table 11B.1: Distribution of case and deaths of Kala-azar since 1986

Years	Cases	Deaths
1986	17806	72
1992	75523	1417
1993	44155	706
1994	22831	349
1995	22597	277
1996	27049	687
1997	17429	255
1998	13577	226
1999	12886	297
2000	14753	150
2001	12239	213
2002	12140	168
2003	18214	210
2004	24340	156
2005	38335	157
2006	39178	187
2007	44533	203
2008	33598	151
2009	24212	93
2010	29000	105
2011	33187	80
2012	20600	29
2013	13869	20
2014	9241	11
2015	8243	5
2016*	2306	0

** (May 2016)*

The factors that primarily influenced resurgence and increasing prevalence include large scale migration of populations for economic reasons, development of new agro-industrial projects, massive rural-urban migration, man made environmental changes making an area conducive for transmission, malnutrition, disruption of health services and epidemiological changes due to leishmania and HIV co-infection. Risk factors in individual persons are: past history of other diseases, family history of kala azar, mud-plastered walls, granary inside house, presence of bamboo trees, not using DDT spray. In view of these problems planned control measures were initiated to control Kala-azar.

WHO goal for South East Asia

"Elimination of Kala Azar by 2016".

NATIONAL HEALTH POLICY 2002

Goal is to "Eliminate Kala azar by 2010".

XII Plan

Initial target of Elimination set by NHP (2002) was 2010 which later got extended to 2015 in 12th Financial Plan Document.

- Target for elimination to reduce incidence of the disease to less than one case per 10000 population at block PHC level.
- The elimination strategies include surveillance, case detection and treatment, integrated vector management and cross cutting interventions like capacity building, IEC/BCC, monitoring & evaluation and operational research.
- Altogether 54 districts (33 in Bihar, 11 in West Bengal, 4 in Jharkhand and 6 in Uttar Pradesh are endemic for KA.
- Sporadic case reported from Assam, Himachal Pradsh, Jammu & Kashmir, Kerala and Uttarakhand.

PROGRAM

Strategy for control

The strategy for Kala-azar control broadly included three main activities:

1. Integrated vector control
2. Enhanced case detection and complete treatment including introduction of rK 39 rapid diagnostic kits and oral drug Miltefosine for treatment of Kala-azar; and
3. Communication for behavioral impact and intersectoral convergence;

4. Capacity building;
5. Monitoring, supervision and evaluation;
6. Operational research.

Integrated Vector Control

IVM for elimination of Kala-azar comprises the following:

a) Sand fly control: DDT is the choice of insecticide for *Phlebotomus argentipes*, the vector of Kala-azar. Two rounds of spray is done in human dwellings, animal shelters and all other resting places up to a height of 6 feet from floor level. First spraying operation can be done in Feb-March and second in May-June. 75% of DDT of One Kg can be mixed in 3 gallons of water or 50% of DDT of one and an half kg can be mixed in 3 gallons of water is sufficient for 6000 sq.ft. The spray should be 100 mg per square feet.
b) Currently Indoor Residual spray with DDT 50% being carried out in all the Kala-azar districts except 7 districts in Bihar where Synthetic Pyrethroid has been introduced during 2015.
c) Personal protection to prevent human vector contact by use of ITMN / LLIN
d) Microenvironment management (Pucca houses and living conditions)
e) Environmental code of practices (ECoP) to reduce sand fly to breed in conducive atmosphere, ECoP documents are available in NVBDCP website.

Case Detection and Complete Treatment

- A 'suspect' case: history of fever of more than 2 weeks with splenomegaly & hepatomegaly not responding to anti malarial and antibiotics in a patient from an endemic area.
- Or a patient with above symptoms clinically examined by doctor and found positive on screening with rapid diagnostic test.
- Or in cases with past history of Kala-azar or in those with high suspicion of Kala-azar but with negative RDT test result but found (+) by examination of bone marrow/spleen aspirate for LD bodies at appropriate level (district hospital).

Although **aldehyde test** is commonly carried out in India to make the diagnosis of Kala-azar but this has a drawback of becoming positive only 2-3 months after the onset of disease and revert to negative 6 months after cure. rK 39 rapid diagnostic kits and **ELISA** are better and fast test but usually performed in epidemiological studies.

Treatment of Kala-azar is available in all the affected government hospitals and dispensaries free of cost. For treatment, single dose single day treatment with Liposomal Amphotericin B injection is the first drug of choice followed by capsule Miltefosine (28 days) and injection Amphotericin B (15 injections on alternate days) as well as combination of Miltefosine and Paramomycin injection.Post Kala-azar Dermal Leishmaniasis (PKDL) patients are to be treated with (i) Miltefosine: 100mg orally per day for 12 weeks, or (ii) Amphotericin B deoxycholate: 1mg/kg over 4 months 60-80 doses at what frequency, or (iii) Liposomal Amphotericin B: 5mg/kg per day by infusion two times per week for 3 weeks for a total dose of 30mg/kg.

Communication for behavioral impact and insectoral convergence

Health education is must for the Kala-azar control. Protective measures like avoiding sleeping on floor, and using fine-mesh betnets. Cleaning of the environment and clean shelters for animals are necessary control measures. All the cracks and crevices should be closed by cement or appropriate material. Animal house, cow-shed, and dairy should be kept clean; water well should be kept closed; and not to sleep naked or application of home made mustard oil lotion which is also very important measure that can be undertaken by the community at individual level. Never let the patient be treated with quacks that can cause death of the patient. Neither other methods should be tried because treatment specified above is very effective and safe and freely available in all health centers in affected areas.

Capacity Building

All levels of staff need to be trained in early detection and treatment.

Monitoring, Supervision and Evaluation

Proper monitoring supervision and evaluation of program is vital to the program management. This work is linked with the malaria and other vector borne diseases control.

Kala-azar has been declared as "Notifiable disease" in Bihar and West Bengal

Operational Research

- Development of cost effective, sustainable and operationally feasible integrated vector management strategies.
- To develop satellite based health mapping for kala-azar.
- Health seeking behavior of different community groups
- Community behavior towards use of Insecticide treated bednet and acceptance of bednets
- Drug compliance studies and development of drug response monitoring protocol, etc.

Key indicators in the KA elimination

Detection rate (%):
Number of new cases of KA detected per year in the district X 100/ Total population in the same area

Treatment completion rate (%):
Number of patients that took a full course of drugs X 100 /All new KA cases that started treatment in a given period

Coverage rate of vector control (%):
Number of households received spray x 100 /All targeted households at risk

COMMENTS

- The disease is common in poor sanitation, illiteracy, and poverty. After getting ill majority of patients report to private practitioners and sometime get treatment from quacks (untrained doctors). The average cost of Kala-azar incident is calculated as Rs. 15,767 which is almost two and a half times of total average annual per capita household income in Nepal. This cost must be little higher in India and true burden on family where patient fall sick. In such situations it is important to provide support from government and educate the community and train private practitioners for proper diagnosis and standard treatment regimen.
- Emergence of co-infection of Leishmania with HIV has made the Leishmaniasis scenario more complicated. Both infections being immunosuppressive, management of such cases is a serious challenge (Pattanayak 2001). There is a need of research for the development of newer drugs and vaccines to meet this challenge. Drugs like *Miltefosin* and *Paramomycin* have given a new ray of hope in this direction but awareness of these drugs is limited. The whole program need to be evaluated and bottlenecks should be removed so that disease elimination target can be achieved.
- In all the affected states, many districts do not receive funds in time due to delay in releasing funds from state.
- All the patients do not report to the passive agencies like PHCs and hospitals and a proportion of patients receive treatment through private sector with consequent under-reporting.
- Drug unresponsiveness, particularly to first line drug sodium stibogluconate has been reported to increase.
- Prolonged treatment schedules as presently used drugs are injectables/parental infusion with long duration regimen. Therefore, patient compliance is a challenge.
- Treatment protocols are not followed properly as treatment cards are not being used. Therefore it is difficult to monitor patients compliance as far as regulatory of the treatment is concern.
- There is inadequate social mobilization to achieve desired behavioral change, which needs to be pursued on sustainable basis.
- Both coverage and quality of Insecticide Residual Spray are unsatisfactory.
- Although kala-azar is a notifiable disease in Bihar and also in West Bengal, revalidation of Gazette Notification dated 30th Nov 1991, with appropriate modifications as deemed necessary is required. In other three affected states, similar step needs to be taken up.

References

Adhikari SR, Maskay NM. Economic cost and consequences of Kala-azar in Danusha and Mahottari Districts of Nepal. Ind J Com Med 2005; 30 (4): 121-125.

Dhillon GPS, Sharma SN, Nair B. Kala-azar elimination program in India. JIMA 2008: 106 (10): 664-668.

http://www.nvbdcp.gov.in

Govt. of India. Annual Report 2010-2011. Ministry of Health & Family Welfare. Nirman Bhawan New Delhi 2006.

NVBDCP. Operational Guidelines on Kala-azar elimination from India 2015, Govt of India.

Pattanayak S. Kala-Azar: Potentially eradicable disease as a public health challenges. Ind J Pub Health 2001; 45 (2): 41-42.

WHO-SEARO. Health Situation in the Southeast Asia Region 1994-1997. WHO-SEARO, New Delhi 1999.

11C.
LYMPHATIC FILARIASIS

INTRODUCTION

Bancroftian filariasis caused by *Wuchereria bancrofti*, which is transmitted to man by the bites of infected mosquitoes- *Culex, Anopheles, Mansonia* and *Aedes*. Man is the definite host and mosquito is the intermediate host of Bancroftian and Brugian filariasis. The adult filarial worm lives in lymphatic vessels whereas microfilaria lives in peripheral blood and are able to infect mosquitoes when they come to feed. This infection causes lymphangitis, lymphadenitis, elephantiasis of genitals, legs and arms and causes tropical eosinophilia due to hypersensitivity. The disease may cause severe deformity and disability.

EPIDEMIOLOGY

The WHO has estimated that 600 million people are at risk of infection in South-East Asia and 60 million are actually infected in the region. There are about 553 million people at the risk of infection with 48 million (80% i.e., 48 out of 60 million) infected with parasite in India. Lymphatic filaria is prevalent in 250 districts in 20 states and union territories. Bancroftian filariasis is widely distributed while brugian filariasis caused by Brugia malayi is restricted to states-UP, Bihar, Andhra Pradesh, Orissa, Tamil Nadu, Kerala, and Gujarat. According to reports collected from control units and clinics, Microfilaria (Mf) rates are declining during the last many years (Table 11C.1). Morbidity surveys of diseased case in the states revealed 497784 cases of lymphoedema and 308458 case of hydrocele. The microfilaria survey reports received from 205 districts revealed that 867487 persons were examined recording an average ***mf*** rate of 1.07%. In 2010, mf rate was highest in Assam as 1.06%, in Karnataka 0.89% and in Maharashtra 0.53%.

Economic Loss

About 1.2 billion man-days are lost due to filariasis every year leading to an economic loss of Rs. 3500 crore (Ramaiah et al 1998).

Indices of Filaria

Parasitological indices: 1) Mircofilaria Rate: Percentage of persons showing Mf in their peripheral blood in a sampled population; 2) Filarial Endemicity Rate: Percentage of persons examined showing microfilariae in blood, or disease manifestation or both; 3) Microfilarial Density: No. of Mf per unit volume of blood in samples from individual persons; 4) Average Infestation Rate: Average number of Mf per positive slide. *Entomological indices:* 1) Vector density per 10 man - hours catch; 2) Percentage of mosquitoes positive for all stages of development of parasite; 3) Percentage of mosquitoes positive for infective larvae; 4) types of breeding places.

CLINICAL PRESENTATION

There are bouts of fever accompanied by pain, tenderness and erythema along the course of inflamed lymphatic vessels. Inflammation of the spermatic cord, epididymitis and orchitis is common. The fever subsides after a few days. Similarly, symptoms and signs are also subsided. Further attack follow, temporary edema becomes more persistent, and regional lymphnode enlarge. Progressive enlargement, coarsening corrugation and fissuring of skin and subcutaneous tissue with warty superficial excrescences develop gradually causing elephantiasis (leg resembles that of an elephant).

Pathology

The thread like adult worms live coiled together in human lymphatics. In most infections the microfilariae

Table 11C.1: Distribution of microfilaria and Death rates in India since 1994

Year	Mf rates	Disease Rates/1000
1994	1.20	0.89
1995	1.18	0.88
1996	1.15	0.75
1997	1.15	0.80
1998	0.88	1.04
1999	0.70	0.70
2000	0.85	0.52
2001	0.68	1.79
2002	0.42	0.92
2003	0.42	0.92
2004	1.24	-
2005	1.02	-
2006	0.98	-
2007	0.64	-
2008	0.48	

are found in the blood in greatest numbers between 9PM and 2AM In the repeated infection the presence of mature worms in the lymphatic vessels and nodes leads to allergic inflammation around the lymphatics and temporary lymphatic obstruction. Eventually, after repeated attacks, bacterial infection play a part, permanent obstruction of a main lymphatic trunk may be produced. Progressive enlargement of the limb or region below the obstruction then follows with thickening and fibrosis of the tissues. In India, 99.4% of the cases are caused by the species - Wuchereria bancrofti whereas Brugia malayi is responsible for 0.6% of the problem.

Diagnosis

The diagnosis is made on clinical grounds, supported usually by an eosinophilia and positive compliment-fixation or intradermal test. After about a year from the time of infection microfilariae appear in the blood at night. This can be demonstrated in a blood smear.

There are following categories depending upon the symptoms:

Categories	*Symptoms*
Mf carriers	Asymptomatic but Mf circulate in blood
ADL	Fever with adenolymphangitis
Lymphedema I	Reversal edema in limbs overnight, skin normal; damage to the lymphatic system
Lymphedema II	Irreversible edema in the limbs even with elevation; skin normal; repeated attacks of ADL
Lymphedema III	Irreversible edema in the limbs; skin thickened; repeated attacks of ADL
Lymphedema IV	Irreversible edema in the limbs; skin fold thickening, pigmentary changes, chronic ulceration and epidermal and subepidermal nodules; myiasis
Hydrocele <15 cm	Swelling of scrotum (Tunica)
Hydrocele ≥ 15cm	Swelling of scrotum (Tunica)
Chyluria	Milky urine due to obstruction of lymphatic system

Brugia Filariasis

The pathology, clinical manifestations, treatment and personal prophylaxis are same as those for W. bancrofti except that elephantiasis is usually limited to the legs.

World Health Assembly Resolution

International Task Force for Disease Eradication identified lymphatic filariasis as one of the six infection diseases (Polio, Leprosy, Guinea Worm, Filariasis/ Oncocerciasis, Measles and Chagas Disease) to be eradicable or potentially eradicable. World Health Assembly made resolution for elimination of lymphatic filariasis in 1997 and India was also signatory. WHO announced the Global Program to Eliminate Lymphatic Filariasis in 1998.

National Health Policy 2002

Goal is to "Eliminate Lymphatic filariasis by 2015".

XI Plan

Following observations are made by the expert groups in XIth plan draft document:

- Training to the health personnel at different levels need to be streamlined.
- Hydrocele operations to be intensified.
- Management of patients suffering from lymphoedema at their doorstep.
- Involvement of medical professionals from all sectors and civil society organization and media sensitization need to be geared up through advocacy.
- Development of software for computerized MIS.

Targets

- To cover all eligible population in 243 filarial endemic districts during MDA
- To line list the cases of lymphoedema in all the districts and augment home based morbidity management and hydrocele operations in identified district hospitals/CHCs

Indicator

- % of population actually consumed Drug
- Microfilaria rate in sentinel sites of the districts
- Member Hospitals/CHCs equipped for hydrocelectomy
- Number of Hydrocele operations conducted out of total enlisted
- No. of complications after hydrocelectomy to assess quality of service per 1000 operations
- % of Lymphedema cases practicing Home based management

Evaluation of program

- Coverage and Compliance will be verified by independent assessment by involving medical colleges and research institutions. In rural areas, three clusters each having 30 households in urban area in each district will be surveyed.
- Microfilaria Survey: The time of night blood survey i.e., between 8.30 pm and 11.30 pm will cross-checked by concurrent and consecutive Visits.
- Side effects of DEC will be monitored.

Initiatives

- Field based operational research for improvement in drug compliance such as the assessment of impact of home based morbidity management to improve the quality of life and socioeconomic conditions of the patients.
- Involvement of NGO/Private sector/ Community/ local self government in implementation and monitoring program. NGO/Private sector/ community local self government will be involved in the program by building their capacity on various aspects of ELF program e.g. local monitoring of distribution of drug, mopping up operations improvement in converge and compliance. It would be advisable to include social sector department such as educations, youth affairs, social welfare, rural development, Panchayat, municipal Corporation, information and broadcasting etc. in the DCC. Representations from professional organizations association like CII (Conferation of Indian Industry), IMA (Indian Medical Association), FICCI (Federation of Indian Chambers of Commerce and Industry), ASSOCHAM (Associated Chamber of Commerce and Industry of India) , etc. are also co-opted as members besides NGOs.

The possible areas of partnership are:

- Mapping of areas through morbidity surveys,
- Social Mobilization for drug compliance,
- Supporting mass drug administration and management of adverse reactions.
- Morbidity Management at community level.

Efficiency and Quality: Improve efficiency and quality of services at primary, secondary and tertiary levels through training, and capacity building.

Monitoring and Evaluation: will be carried out regularly and focus will be on quality of information, compliance of drugs, impact evaluation and Health Management Information System.

PROGRAM

The National Filaria Control Program was launched in 1955. The activities were mainly confined to urban areas. However, the program has been extended to rural areas since 1994.

Objectives

- Reduction of the problem in unsurveyed areas; and
- Control in urban areas through recurrent anti-larval and antiparasitic measures.

Control Strategy

1. Vector Control Anti-Mosquito and Anti-larval Measures

One or two rounds of residual insecticide spray with DDT (1 gm/sq mt.) in areas which is known to be endemic for filariasis. Anti-larval measures with temephos in prescribed dosage (56-112 g/ha) in water storage tanks every weeks and application of Mineral Larvicidal Oils (MLO) on water surface are practiced.

2. Biological Control through larvivorous fishes.

3. Environmental engineering through source reduction and water management;

4. Antiparasitic measures: through diagnosis and "treatment of microfilaria carriers and cases;

a) *For the individual case treatment:* Diethyl Carbamazine (DEC) is given for Bancrofti filariasis in the dose of 6 mg/kg body weight orally daily for 12 days in divided doses after meal (a total of 72 mg per kg of DEC). For the Brugian filariasis, DEC is given 3-6 mg/kg body weight per day up to total dose of 18-72 mg per kg.

There is a report of successful treatment of elephantiasis with doxycycline given for 14 days.

Recommended dose of DEC tablets (100 mg)

For 2-5 year	1 tablet
For 6-14 years	2 tablets
For 15 years & Above	3 tablets

Note: Children below 2 year and pregnant women and seriously ill person should not take DEC

b) *Mass treatment:* Every member of the community irrespective of infection are treated with DEC. This mode of control has been tried in many areas. In some areas selective cases of Microfilaria positives are treated with DEC. In Lakshdweep island, and Pondicherry, the whole community is treated with DEC – medicated salt (1-4 g of DEC per kg of common salt) and found that this regimen is safe, cheap and effective.

Safety of DEC: For more than fifty years, DEC has been the drug of choice for treating lymphatic filariasis. As the mainstay of treatment both of the individual case and of the infected communities, it has been administered to millions of persons throughout the world under widely varying conditions of endemicity and in various doses. This wide experience with DEC has shown to have low toxicity and to be safe for large-scale use in lymphatic filariasis, even in the circumstances of limited medical supervision.

Revised Strategy: Single dose mass treatment of Diethylcarbamazine (DEC) alone or combined with *Albendazole* repeated at six months or one year, is claimed to bring down the microfilaria rate by over 80%. This strategy is implemented in 31 endemic districts for elimination of filarial. DEC-fortified table salt brings the microfilaria rate to a negligible level within 6 to 8 months of its introduction. Under the National Program one dose of DEC tablet once a year for at least five year on National Filaria Day is recommended.

Single dose of *Ivermectin* (20-400 ug/kg of body weight) has been found to be effective, but it is associated with high recurrence rates (5-40%) after 6 months of treatment in bancroftian infections.

5. ***Behavior Change Communication:*** IEC to generate community awareness and to change behavior for health practices.
6. ***Capacity building*** for home based management of lymphoedema cases and hydrocelectomy at CHCs and hospitals.

Infrastructure

National Filaria Control Program is being implemented through 206 filaria units, 199 filaria clinics and 27 survey units, primarily in endemic urban towns. Village Health Guide or health workers male under the Primary Health Center (PHC) is the most peripheral workers who is responsible to carry out anti-filariasis activities; Medical Officer of PHC is supervising the workers. Health worker will distribute DEC tablet in filaria affected areas through house to house visits. DEC tablet must be swallowed immediately in front of the drug distributor. District Health Officer is directly responsible for anti-filariasis measures in his area.

Mass administration of DEC as well as homebased morbidity management, scaling up hydrocelectomies in CHCs in 200 districts of the country has been launched that covered 73% of the targeted population in 2004-5. In Post MDA assessment survey it was recorded that actual drug compliance is much lower than reported because of lack of health workers and drug distributors. In 2005-06 it is decided to cover 243 districts covering 525 million population. In 2007, National Filaria Day was observed on 15th November and all the 250 Filaria endemic districts have been covered under MDA with a coverage of 82% against eligible population of 518 million.

COMMENTS

Organizing National Filaria Day appears to be ritualistic activity as neither it covers entire endemic areas nor coverage is complete. There is lack of political will and workers have lost enthusiasm. Besides logistic constraints, program has not given adequate emphasis on IEC, monitoring, supervision, and evaluation. Intersectoral coordination and involvement of NGOs have not been up to the mark. Community is neither involved in program planning nor in implementation (Misra & Singh 2003). In an assessment it was found that mass drug administration in Surat city the consumption was 77% and 12% took the drugs but did not consumed and 11% refused .Reasons for not consumption were side effects, too many tablets, not consented by head of the family etc. Refusal was because of side effects, people feel it is not a problem so why to take drug, no faith on workers, fear of impotency, etc. (Vaishnav 2006). Similarly in another evaluation study in Karnataka it was found that coverage of DEC plus albendazole was 82.9% and DEC only was 19.1%. The compliance rate for DEC was 74%. Failure to drug deliver was reported by 615 of the eligible population and only 1.23% had side effect. The study suggest that there is need to improve drug delivery system.

References

Anil NS. Assessing coverage of mass drug administration against lymphatic filariasis in Gulbarga District, Karnataka. Int J Med and Public health. 2012; 2 (3): 25-28.

Das PK, Pani SP: "Filariasis", Epidemiology and control. *In: Helminthology in India (Edited by: Prof ML Sood).* 2002, *in press*

http://www.nvbdcp.gov.in

Govt. of India. Annual Report 20056-2007. Ministry of Health & Family Welfare. Nirman Bhawan New Delhi 2006.

Misra CP, Singh N. Lymphatic Filariasis: Constraints ahead. Ind J Pub Health 2003; 48 (3): 27-30.

Ramaiah et al. Tropical Med & Intl. Health 1998; 3:108-115.

Sabesan S, Palaniyandi M, Das PK, Michael E: Mapping of lymphatic filariasis in India. *Ann Trop Med Parasitol* 2000, 94:591-606. PubMed

Vaishnav KG, Patel IC. Independent Assessment of mass drug administration in filariasis affected Surat city. J Comm Dis 2006; 38(2): 149-154.

11D. JAPANESE ENCEPHALITIS (JE)

INTRODUCTION

Japanese encephalitis (JE) is a zoonotic disease and caused by an arbovirus, group B (Flavivirus) and transmitted by Culex mosquitoes. There are two cycles of transmission: one is **pig-mosquito-pig**, and another **Ardeid bird-mosquito-Ardeid bird**. The disease is transmitted to man by the bite of infected mosquitoes. Man is **an incidental** "dead-end" host and man to man transmission is not recorded till now. The main vector is Culex group belong to the C. *Vishnii*, C. *tritaeniorhynchus*, *C genidus* other are pseudo *vishnii* in India. The pigs are considered as amplifier.

BURDEN OF DISEASE

Recently this disease have caused many epidemics and become a major public health problem. This disease has been reported from 26 states and UTs since 1978, only 15 states are reporting JE in the recent past repeatedly. The case fatality in India is 35%, which can be reduced by early detection, immediate referral to hospital and proper medical and nursing care. The total population at risk is estimated 160 million. The most disturbing feature of JE has been the regular occurrence of outbreak in different parts of the country. The earlier notable outbreaks have occurred in Nagpur (1955), North arcot Madras (1995) and Agra UP (1958). In 1973 the first major epidemic was reported in West Bengal, from Nakura and Burdwan districts followed by another outbreak in 1976 (Banarjee 1996). Between 1977 and 1979 extensive outbreaks involved new areas, including Tamil Nadu, Karnataka, West Bengal, Andhra Pradesh, Bihar, Assam, and Uttar Pradesh (Reuben and Gajanana 1997). Since then, these areas have become prone to outbreaks of JE each year. under National Anti-Malaria Program national level surveillance of JE in India was started (BBIN 2003). New areas have been involved in transmission of JE include, few districts from Tamil Nadu, UT of Pondicherry, Goa, Kerala, and Haryana (Samuel et al 2000). Eastern UP epidemic in 2009 killed 552 among 4000 cases (Asia Pacific Daily Report Dec 11th 2009). From 15 states the cases and deaths are reported and presented in Table 11D.1.

Table 11D.1: Distribution of Cases and deaths of Japanese Encephalitis in India since 1996

Years	Cases	Deaths
1996	2244	593
1997	2516	632
1998	2120	507
1999	3428	680
2000	2593	556
2001	2061	479
2002	1765	466
2003	2568	707
2004	1695	367
2005	6727	1682
2006	2854	658
2007	4024	963
2008	3839	684
2009	4482	774
2010	5167	679
2011	8249	489
2012	8344	1256
2013	1086	202
2014	1661	293
2015	1694	288

The clinical manifestations of the disease are characterized with high-grade fever, convulsion, confusion, stiffness of neck and altered levels of consciousness from stupor to deep coma. JE affects more younger

people in the age group of 3-15 years and more to male in rural areas due to breeding of mosquitoes in rice paddies with close association with pigs, wading birds, and ducks. The fatality rate varies between 10%-40% and those who survive do so with various degrees of neurological complications like paralysis and cognitive deficiencies.

PREVENTION AND CONTROL

Government of India has constituted a Task Force at National Level which reviews the JE situations and its control strategies from time to time. Under National Vector Borne Diseases Control Program (NVBDCP) technical support provided to states for outbreak investigation and control. Insecticides used under the National Anti-malaria Program are used for the control of JE outbreaks, wherever required. There is separate allocation for JE control including training and IEC under the NVBDCP.

Strategy

1. Strengthening the surveillance activities through sentinel sites in tertiary health care institutions,
2. Early diagnosis and proper case management at PHCs CHCs and hospitals
3. Behavior change communication of community to promote early case reporting, personal protection, isolation of amplifier host, etc.;
4. Integrated Vector control measures mainly fogging during outbreaks, space spraying in animal dwellings, and antilarval operation wherever feasible, larvivorous fishes, and personal protection; and
5. Capacity building through trainings of medical and nursing staff;
6. Development of a safe and standard indigenous vaccine. Vaccination for high risk population particularly, children of 1 to 15 years of age.

Epidemiological monitoring of the disease for effective implementation of prevention and control strategies is important component and need to be strengthened. Major activities of the Directorate of NVBDCP are related to responding to outbreak situations, investigation of epidemics and its containment. Recommended measures for the control of outbreak are:

a) Vector control-Aerial or ground fogging, with the ultra-low volume insecticides (e.g. malathion, fenitrothion). The spraying should cover the vegetation around the houses, breeding sites and animal shelves in the affected villages;
b) Prevention of man-mosquito contact by using bednets, screening and repellants;
c) Prevention of animal reservoirs-mosquito contact;
d) Community awareness through various media like radio, TV, miking interpersonal communication and emphasis is given on keeping pigs away from human dwellings or in pigsties particularly during dusk to dawn, which is the biting time of vector mosquitoes; and
e) Sentinel surveillance including serological and clinical surveillance in endemic and their adjoining areas.

There is no specific treatment of JE. Clinical management is supportive. The affected districts must procure medicines, equipments, and accessories as well as sufficient trained manpower. The central government is supporting training programs.

Vaccination

Vaccination in high risk areas and high risk population wherever feasible is advocated, however, vaccination with killed JE vaccine is not recommended for the control of an outbreak. In India the mouse brain-derived inactivated JE vaccine was being manufactured at the Central Research Institute (CRI), Kasauli. The mouse brain-derived JE vaccine is administered subcutaneously in 3 doses of 0.5ml or 1 ml (day 0,7,30) and booster dose at the intervals of every 3 years. The vaccine is best used in the inter-epidemic period to younger population of 1-15 years of age. Vaccination is considered as a very cost effective tool in controlling JE on a permanent basis. Vaccination provides immunity lasting for few years. The vaccine is procured directly by the state health authorities. However, there is lack of supply of this vaccine in India and need to be further strengthened its production. In 2006, Government of India has initiated JE vaccination program as an integral component of Universal Immunization Program with single dose live attenuated JE vaccine in 11 endemic districts of 4 states namely UP, Assam, West Bengal, Karnataka for children between 1 and 15 years of age. Initial decrease in incidence rate of JE in these states (Dhillon GPS & Raina VK 2008) may not be attributed to vaccination because in 2011-12 there was increase number of cases.

NIV, ICMR and Bharat Biotech Ltd has developed indigenous vaccine named "Janvac" which was launched in October 2013. The JE vaccine candidate strain (821564 XZ), used for making this vaccine was isolated from the blood sample collected from an encephalitic patient admitted to the Government Hospital in Kolar, Karnataka between Nov-Dec 1981. Previously it used to be imported from China (India Medical Times 2013). Introduced 2 doses of JE vaccine under RI to be given at 9 and 16-18 months interval along with measles and DPT doses with effect from April 2013.

References

Dhillon GPS and Raina VK. Epidemiology of Japanese Encephalitis in Context with Indian Scenario. JIMA 2008; 106:10:660-663.

Government of India. Annual Report 2006-2007 and 2009-10. Ministry of Health & Family Welfare. Nirman Bhawan New Delhi.

http://www.indiamedicaltimes.com/2013/10/04/indigenous-japanese-encephalitis-vaccine-launched/

Jacobson J, Srilatha Sivalenka. Japanese Encephalitis globally and in India. Ind J Public Health 2004; 48 (2): 49-56.

NVBDCP 2007 (www.nvbdcp.gov.in).

NICD. Japanese Encephalitis-control mechanism requires strengthening. CD Alert 2000; 4 (3).

Park's Textbook of Preventive and Social Medicine (16th Edition) 2000.

Reuben R, Gajanana A. Japanese encephalitis in India Ind J Pediatric 1997; 64: 243-25.

Samuel PP, Hiriyan J, Gajanana A. Japanese encephalitis virus infection in mosquitoes and its epidemiological implications. ICMR Bull 2000; 30: 37-42.

11E. DENGUE

INTRODUCTION

Dengue and Dengue Hemorrhagic fever is an acute viral disease caused by a group B arbovirus (Flavivirus) and include serotypes 1,2,3 and 4 (Den-1, Den-2, Den-3 and Den-4) transmitted by aedes mosquito. The incubation period is usually 5-6 days but may vary from 3 to 10 days. Dengue fever (DF) is a self - limiting disease and represents the majority of cases of dengue infection. In some peculiar epidemiological situation, depending on the circulating virus characteristics and host immune status it manifests as a complication of dengue infection with signs of hemorrhage and shock. These two clinical features named Dengue Hemorrhagic fever (DHF) and Dengue shock syndrome (DSS), if not properly managed, may lead to death (Government of India) (Figure 11E.1).

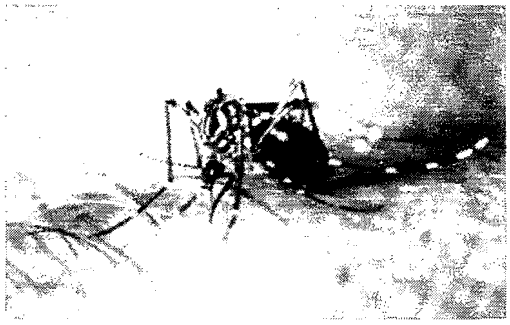


Figure 11E.1 Aedes aegypti mosquito

Dengue epidemiology is multifaceted depending upon human behavior, climate and the movement of viruses and humans. Given the many aspects of dengue which interact directly or indirectly and at different temporal and spatial scales and usually in a nonlinear fashion, it is not surprising that it is difficult to identify a single key factor responsible for the particular dynamics of the disease. Daily, seasonal, and interannual variability in temperature, atmospheric moisture and rainfall all influence the dengue system in a variety of ways. Dengue fever is the most common of all the arthropod – borne viral diseases and is one of the most important emerging diseases of the tropical and sub tropical regions, affecting urban and peri-urban areas.

BURDEN OF DISEASE

The incidence of dengue has grown dramatically around the world in recent decades. Some 2.5 billion people – two fifths of the world's population – are now at risk from dengue. An estimated 100 million cases of dengue fever (DF) and 250,000 cases of dengue hemorrhagic fever (DHF) occur annually (Guzman & Kouri 2002). The past 20 years have seen a dramatic geographic expansion of epidemic DF and DHF from Southeast Asia to the South Pacific Islands, the Caribbean, and the Americans. An increasing number of reports of DF and associated illness among travelers to dengue virus–infected areas parallel the changing epidemiology of dengue in local populations

(Wilder-Smith & Schwartz 2003, Lindback et al 2003, Jelinek et al 2002, Schwartz et al 1996, Badiaga et al 2003, O'Brien et al 2006). As part of a comprehensive analysis of the spectrum of disease in travelers, the GeoSentinel Surveillance Network, a multifaceted international practice network, has noted that in terms of cumulative case numbers over the past decade, dengue has emerged as a more frequent diagnosis than malaria in ill travelers who have returned from all tropical regions outside of Africa (Wilson et al 2007). Not only is the number of cases increasing as the disease is spreading to new areas, but explosive outbreaks are occurring. In 2007, Venezuela reported over 80 000 cases, including more than 6 000 cases of DHF. The numbers of reported cases of imported dengue in countries outside the tropics have also been increasing (www.cdc.gov/ncidod/dvbid/dengue).

The disease is now endemic in more than 100 countries in Africa, the Americas, the Eastern Mediterranean, Southeast Asia and the Western Pacific. Southeast Asia and the Western Pacific are the most seriously affected. Before 1970 only nine countries experienced DHF epidemics, a number that had increased more than fourfold by 1995.

South East Asia Region: The region is divided into four categories on the basis of endemicity of dengue. By 1997 most of the countries of the SEAR have experienced large outbreak of the disease and now a days dengue is a major public health problem in Category A (Indonesia, Thailand, Sri Lanka and Timor-Leste) countries while cyclic trend is seen in Category B (Bangladesh, India, Maldives) countries. Endemicity is uncertain in Category C (Bhutan and Nepal) while in Category D (DPR Korea) no endemicity is found.

In 2003 only 8 countries in South East Asia Region reported dengue cases. As of 2006, ten out of the eleven countries in the Region (Bangladesh, Bhutan, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste) reported dengue cases. Bhutan reported the first dengue outbreak in 2004. An outbreak, with a high case fatality rate (3.55%) was first reported in Timor -Leste in 2005. Nepal reported dengue cases for the first time in November 2006. The Democratic Peoples' Republic of Korea is the only country in this Region of WHO that has no report of indigenous transmission of DF/DHF. In 2006 most countries have reported increase in dengue cases (Bangladesh, Bhutan, Indonesia, Thailand, Maldives and Sri Lanka) whereas India, Myanmar and Timor Leste have reported slightly lesser cases than in 2005. Nepal reported dengue cases for the first time in November 2006.

In 2006 countries that reported less than 1% of the total cases are Bhutan, Nepal and Timor Leste. Maldives, and Bangladesh reported about 1% of the cases whereas India, Myanmar and Sri Lanka reported 6% each, Thailand 23% and Indonesia reported 57 % of the dengue cases in the South East Asia region of WHO.

Total cases in SEAR regions ranged from 46,458 (1986) to 218,821 (1998) and 188,684 (2006). Since 2003 the trend of reported dengue cases is rising although the case fatality rate is maintained below 1%. Till 2003 Thailand reported the highest number of dengue cases in the region. Since 2004 Indonesia reports the highest number of cases from the region. In 2006, 57 % of the cases were reported from Indonesia alone (Figure 11E.2).

For the South East Asia Region as a whole, there is about 18% increase in number of reported cases and about 15% increase in the number of reported dengue deaths as compared to same period last year. There was substantial increase in the reported cases of dengue in Thailand, Indonesia and Myanmar.

India

Dengue fever has been reported from India over a long time, but dengue hemorrhagic fever was first reported in 1963 from Calcutta city (now Kolkata). Since then several outbreaks of dengue fever were reported from India with a major epidemic of dengue hemorrhagic fever that occurred in Delhi in 1996 when 10 252 cases and 423 deaths were reported. Cases have been reported from the neighboring states of Haryana, Punjab, Rajasthan, Utter Pradesh and two southern and western states. DEN-2 was isolated during this epidemic and the proportion of DHF to DF was very high. Although disease is prevalent throughout India in most of the metropolitan cities and towns but outbreaks have also been reported from rural areas of Haryana, Maharashtra and Karnataka (Govt. of India 2008).

The number of DF/DHF cases and deaths reported since the epidemic has been low till 2002 but again has risen in 2003. In 2005, both the reported dengue cases and deaths show three fold increase as compared to 2004 and remain high.

The case fatality has been above 1% for the last 10 years. However, the number of reported dengue cases and deaths are mainly from the capital city Delhi and the other states that have small outbreaks go unreported. Therefore the case surveillance needs further strengthening.

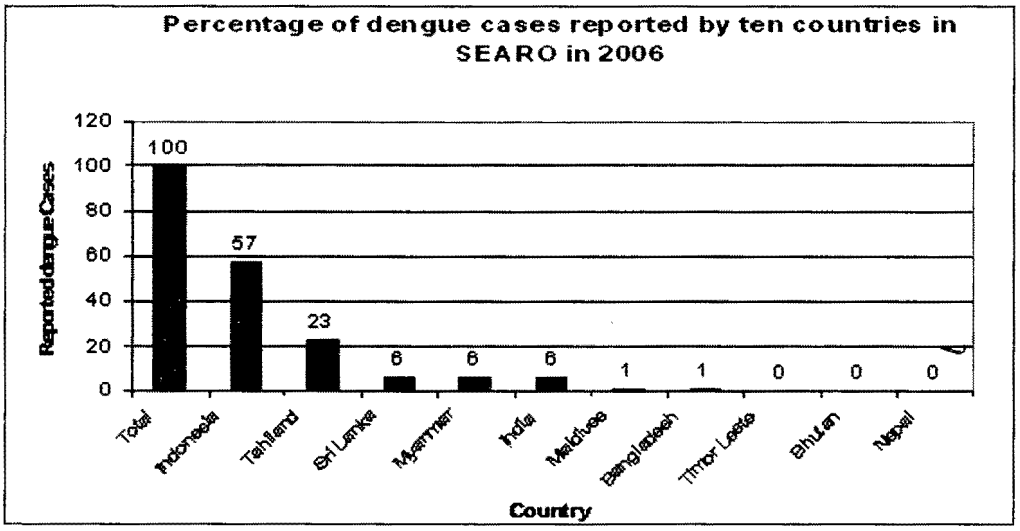
Since 1996, dengue control activities are coordinated and carried out by the National Anti-Malaria Program (Now National Vector Borne Disease Control Program, NVBDCP). In 2006 the number of cases reported as compared to 2005 shows some reduction whereas the case fatality rate has remained above 1%. There is consistent increase in number of dengue cases since 1997 and had epidemics in 2001, 2003, 2005, 2006, 2008 and 2015 (Table 11E.1). Reduction of Case Fatality Rate (CFR) from 0.9% (2011) to 0.2% (2015) **(Figure 11E.3).** Number of sentinel surveillance hospitals increased from 110 in 2007 to 527 in 2015 to improve diagnostic facilities for Dengue. 15 Apex Referral Laboratories have been set up for referral and quality control services, and linked with sentinel hospitals for back up support.

Co-ciruculation of several serotypes of dengue vuruses has resulted in concurrent infection in some patients with multiple serotypes of DV. There is replacement of DV2 and 3 with DV1 as the predominant serotype in Delhi over a period of three year 2007-09 has been reported. Concurrent infection by Chikungunya and DV2 was reported from Vellore and Delhi (Gupta et al 2012).In 2015, though DEN 2 has been isolated in Delhi and Punjab, clinical complications are observed to be comparatively less than documented for DENV2. Age-wise distribution of cases in 2015 indicates maximum cases are amongst age group of 6-15 yrs and 16 to 45 yrs.

Table 11E.1: The problem of dengue since 1997in India

Years	Cases	Deaths
1997	1177	36
1998	707	18
1999	944	17
2000	650	7
2001	3306	53
2002	1926	33
2003	12754	215
2004	4153	45
2005	11987	157
2006	12317	184
2007	5534	69
2008	12561	80
2009	15535	96
2010	28292	110
2013	75808	193
2014	40571	137
2015	99913	220

** Provisional report up to 2015;*



Economics Burden of Dengue

The measurement of non-health impacts of disease has not received as much attention in the past as it will in the future. Partly due to the lack of tools and partly because it has long been considered crass to try to put a price tag on the burden of loss and human suffering. Today, with more competition for resources, there is a need for disease control programs to justify their costs in light of the economic consequences of the "no control" option.

Estimates of the cost of disease are difficult to obtain because they may include the value of lost work, transportation for treatment, medicine and even the loss of income and productivity due to fatal illness in a wage earner. As a result there is only a hand full of such studies and even fewer examples in the area of communicable and vector borne diseases.

A 1995 study from Thailand reported the treatment seeking costs to the family, hospitalization and treatment expenses, lost work, the opportunity cost of lost work by caretakers and even the funeral and permanent economic loss of wage earners were calculated. Morbidity costs ranged between $157 and $198 depending on age. Mortality costs, including funeral expenses and 50 years of lost income were in excess of $120,000 per fatal case.

In one study the total patient costs—direct patient costs and opportunity costs were 118.29 US$ for a child patient and 161.49 US$ for an adult patient in Bangkok, 102.82 US$ for a child patient and 138.02 US$ for an adult patient in Suphan Buri. The net hospital cost in providing treatment for each DHF patient was 54.6 US$ and 38.65 US$ in Bangkok and Suphan Buri, respectively. The total cost of prevention and control of DHF in Thailand from government agencies in 1994 was 4.8724 million US$ (Okanurak et al 1997).

A study by a group of CDC investigators summarizes more than a decade of experience with dengue in Puerto Rico from the perspective of economic impact. Their approach was to examine the disability- adjusted life years (DALY) lost as a result of illness or death from dengue and DHF. Their analyses show a steady increase in lost work and productivity due to the two diseases that has averaged 658 DALYs per one million people over the past 11 years (Meltzer et al. 1998). Since the mean income of the most affected groups is difficult to determine, the present dollar value of those DALYs is not clear but the economic losses to dengue and DHF are believed to be greater than those from all childhood diseases (polio, measles, whooping cough, tetanus, or from meningitis, hepatitis or malaria).

Vectors of Transmission

The Aedes mosquito usually bites during day time. Female mosquitoes get infected after feeding on a viremic host. Once the mosquito becomes infected, it remains so for life. The female mosquitoes can survive up to 3 weeks under normal temperature and humidity. It takes 8-11 days for a mosquito, which has fed on an infectious case to propagate the virus to levels sufficient to transmit. ***Aedes aegypti*** mosquito shows distinct patterns in white lines, a lyre-shaped line on the sides of the thorax and the palps are half white (Figure 11E.1). Seasonal variation in population density and distribution is common for *Ae. aegypti* since it is sensitive to changes in temperature and available moisture (www.iictenvis.nic.in). Below 16^{0}C *Aedes aegypti* ceases to bite. It is also known as Tiger Mosquito.

Aedes aegypti was reported from all the affected areas with house indices exceeding 20%. The National Institute of Virology, Pune and few other institutions in the country carry out surveillance activities on a limited scale. The indices as compared to the month of May 2006 were found higher. The trend data from India shows that cases generally start to increase from august onwards, which is post monsoon season. More importantly, it is clear from data that breeding of Aedes mosquitoes however begins in June itself.

Such data may be taken into consideration, while planning in advance for dengue prevention and control. Thus vector surveillance and control measures supported by community mobilization for behavioral change activities need to be taken before June and sustained throughout the rainy season.

Several attributes make *A. aegypti* an efficient vector for the chikungunya virus: it is highly susceptible to the virus, prefers to live close to people, seeks a blood meal during the day time and bites—almost painlessly—several people in a short period for one blood meal. The mosquito is a domestic breeder. The mosquito, well adapted to life in urban settings, typically

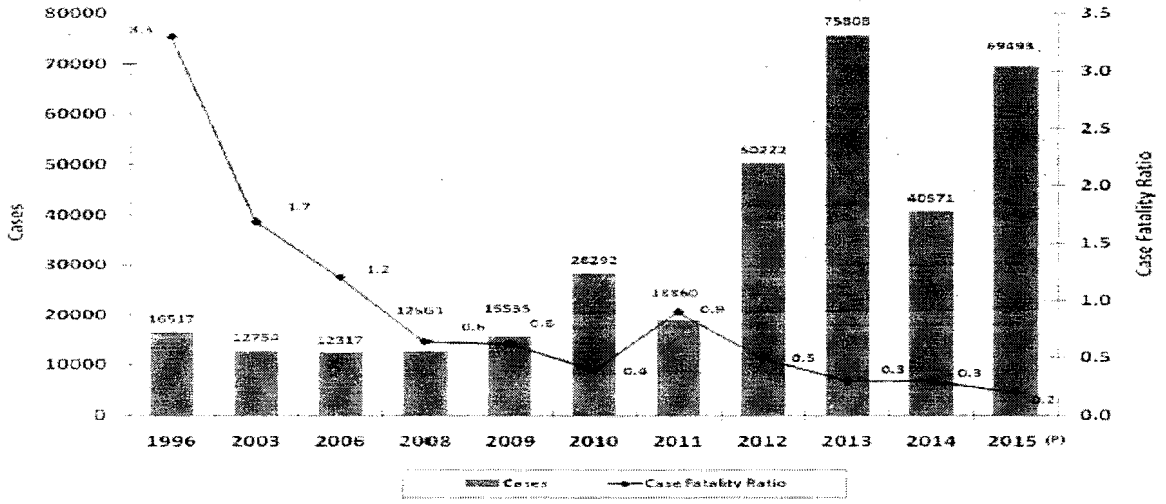


Figure 11E.3. Trends of Dengue cases and fatality

breeds in clean puddles of standing water and collections of water in artificial containers such as tin cans, pots, plastic containers, rain barrels, discarded tyres, desert coolers, overhead tanks, discarded buckets, tyres, utensils and large containers used for collecting rain water which are not emptied and cleaned periodically. Dengue outbreaks have also been attributed to *Aedes albopictus*. The mosquito has characteristic white strips on the back and legs. It is also known as Tiger mosquito.

The mosquito rests indoors, in closets and other dark places. Outside, they rest where it is cool and shady. The female mosquito lays eggs in clean water containers in and around houses, schools and work places. The larvae hatch from the mosquito eggs, and live in the water for about a week; they then change into a round pupal stage for one or two days after which the adult mosquito emerges, ready to bite. Since water is essential during the first 8 days in the life of mosquito, emptying containers once a week will greatly reduce the sources for mosquito breeding and thereby the risk of dengue fever. *Aedes* mosquito can fly upto a limited distance of 400 meters but can spread over vast distances mechanically in various types of vehicles used by man.

Dengue fever /DHF can also occur in rural areas where the environment is friendly for mosquito breeding. Mosquito breeding can occur in containers used for storing water, for cattle feeding and drinking, discarded tins, tyres, bottles etc., which are not emptied and cleaned periodically. Eggs of Aedes aegypti can live without water for more than one year.

CLINICAL MANIFESTATIONS AND TREATMENT

The incubation period is usually 5-6 days but may vary from 3-10 days. The disease is marked by the onset of sudden high fever, severe headache and pain behind the eyeballs, pain in muscles and joints; so the disease is also called "break bone fever". The illness lasts for 6-7 days. Other signs and symptoms, and laboratory criteria are given below. The spectrum of clinical manifestations and management of dengue is given in figure 11E.3.

Vaccine

No effective vaccine is available for dengue. Research into dengue vaccines focuses on the use of live attenuated or inactivated vaccines, infectious clone derivative vaccines, immunogens vectors by various recombinant systems, subunit immunogens and nucleic acid vaccine.

NATIONAL PROGRAM

Strategy

1. Surveillance for disease and vector through sentinel sites in tertiary health care institutions;
2. Early diagnosis and prompt case management;
3. Vector control through source reduction, personal protection and behavior change communication campaign for community participation and social mobilization;
4. Intersectoral convergence for mosquito breed-

Figure 11E.3: Dengue Virus Infection
Dengue Viral Infection

Dengue without Warning sign Group A	Dengue with Warning sign Group B	Severe Dengue Group C
Patients who do not have warning signs AND who are able: • to tolerate adequate volumes of oral fluids • to pass urine at least once every 6 hours Laboratory tests • full blood count (FBC) • haematocrit (HCT) Treatment Advice for: • adequate bed rest • adequate fluid intake • Paracetamol, 4 gram maximum per day in adults and accordingly in children. Patients with stable HCT can be sent home. Monitoring Daily review for disease progression: • decreasing white blood cell count	Abdominal pain or tenderness • Persistent vomiting • Clinical fluid accumulation • Mucosal bleed • Lethargy,restlessness • Liver enlargment >2 cm • Laboratory: increase in HCT concurrent with rapid decrease in platelet count Laboratory tests • full blood count (FBC) • haematocrit (HCT) Treatment • Encouragement for oral fluids. If not tolerated, start intravenous fluid therapy 0,9% saline or Ringer's Lactate at maintenance rate.	Group C criteria Patients with any of the following features: • severe plasma leakage with shock and/or fluid accumulation with respiratory distress • severe bleeding • severe organ impairment Laboratory tests • Full Blood Count • haematocrit • other organ function tests as indicated Treatment of compensated shock Start IV fl uid resuscitation with isotonic crystalloid solutions at 5–10 ml/kg/hr over 1 hour. Reassess patients' condition. If patient improves: • IV fluids should be reduced gradually to 5–7 ml/kg/hr for 1–2 hours, then to 3–5 ml/kg/hr for 2–4 hours, then to 2-3 ml/kg/hr for 2–4 hours and then reduced further depending on haemodynamic status; • IV fluids can be maintained for up to 24–48 hours. If patient is still unstable: • check HCT after first bolus; • if HCT increases/still high (>50%), repeat a second bolus of crystalloid solution at 10–20 ml/kg/hr for 1 hour; • if there is improvement after second bolus, reduce rate to 7–10 ml/kg/hr for 1–2 hours and continue to reduce as above; • if HCT decreases, this indicates bleeding and need to cross-match and transfuse blood as soon as possible. Treatment of hypotensive shock

ing source reduction and personal protection measures besides early reporting of cases.

5. Capacity building.

Vector Surveillance

Larval surveys: For larval surveys, the basic sampling unit is the house or premise, which is systematically searched for water holding containers. Containers are examined for the presence of mosquito larvae and pupae. Depending on the objective of the survey, the search may be terminated as soon as *Aedes* larvae are found, or it may be continued until all containers have been examined. The collection of specimens for laboratory examination is necessary to confirm the species. Four indices that are commonly used to monitor *Ae aegypti* infection levels are:

i) **House index (HI):** percentage of houses infected with larvae and/or pupae
HI = Number of Houses infected÷Number of Houses inspected X100

ii) **Container Index (CI):** percentage of water holding containers infected with larvae or pupae.
CI = Number of positive containers ÷Number of containers inspected X100

iii) **Breteau Index (BI):** number of positive containers per 100 houses inspected
BI: Number of positive containers÷ Number of houses inspected X100

iv) **Pupae Index (PI):** number of pupae per 100 houses
PI = Number of pupae ÷ Number of houses inspected X100

Adult Surveys

i) Landing/biting collection: Landing/biting collection of humans is a sensitive means of detecting low level infestations of *Ae aegypti*, but are very labor intensive. Because adult males have low dispersal rates, their presence can be a reliable indicator of clear proximity to hidden larvae habitats. It is usually expressed in terms of landing/biting counts per man hour.

ii) Resting collection: During periods of inactivity, adult mosquitoes typically rest indoors, especially in bedrooms and mostly in dark places, such as cloth closets and other sheltered sites. Resting collection requires systematic searching of these sites for adult mosquitoes with the aid of flashlight. Following a standard timed collection routine in selected rooms of each house, densities are recorded as the number of adults per house or number of adults per man hour of human efforts.

iii) Oviposition traps: Ovitraps are devices used to detect the presence of *Ae aegypti* where the population density is low and larval surveys are largely unproductive (when the Breteau index is less than 5) as well as normal conditions. The ovitrap is used for *Ae aegypti* surveillance in urban areas to evaluate the impact of adulticidal space spraying on adult female population.

Active monitoring and surveillance of the natural mosquito population should accompany control efforts in order to determine the impact of the dengue control program. 79 surveillance sites have been identified by the government.

Control

There is no separate budget for this however, resources of Directorate of NAMP are utilized, for investigation, prevention, control of dengue/DHF outbreak, training of paramedical and medical staff. An intensive IEC campaign is launched preventing and containing all vector borne diseases including Dengue.

During outbreaks, emergency control measures may also include the application of insecticides as space spray to kill adult mosquitoes using portable or truck mounted machine. However, the killing effect is only transient and variable in its effectiveness because the aerosol droplets may not penetrate indoor to micro-habitats where adult mosquitoes are sequestered. Regular monitoring of vectors susceptibility to most widely used insecticides is necessary to ensure the appropriate choice of chemicals.

Following initiatives of the government are started:

- Observance of **National Dengue Day** on 16th May, 2016.
- A mobile App called '**India Fights Dengue**' has been developed by NVBDCP/M0HFW, GoI in coordination with National Health Portal (NHP)/ National Institute for Smart Government (NISG).
- This App was launched by Hon'ble Union Minister for Health and Family Welfare on the event of

World Health Day celebration on 7th April, 2016.

- It is android based and can be downloaded from Google play store and can be run on internet and mobile phone.
- The basic idea of developing this App is to empower the Community for their involvement and active participation in Dengue control especially in source reduction activities.

Vector Management

Environmental Management

The major environmental management methods used for control of immature stages of dengue vector are:
(i) Environmental modification: Long lasting physical transformation of vector habitats. For example, improved water supply, mosquito proofing of overhead tanks, cisterns or underground reservoirs.

(ii) Environmental manipulation: Temporary changes to vector habitats that involve the management of essential and nonessential containers and management of or removal of .natural breeding sites.

(iii) Changes in human habitations: Efforts are made to reduce man-virus contact by mosquito proofing of houses with screens on doors/windows.

Personal Protection

Protective clothing and repellents are common means of personal protection against mosquitoes and other biting insects. Household insecticide products, namely, mosquito coils, pyrethrum space spray and aerosols have been used extensively for personal protection against mosquitoes. Insecticide treated mosquito nets have limited utility in dengue control, since the vector species bite during the day time. However, insecticide treated bed nets can be effectively used to protect infants and night workers while sleeping in daytime.

Biological Control

(i) Larvivorous fish are recommended for control of *Ae. aegypti* in large water bodies or large water containers.

(ii) Endotoxin-producing bacteria, Bacillus thuringiensis serotype H-14 (Bt H-14) has been found an effective mosquito control agent.

Chemical Control

Chemical control measures (larvicides, adulticides) are recommended in permanent big water containers where water has to be conserved or stored because of scarcity of water or irregular and unreliable water supply.

(i) Larvicide: Since *Ae aegypti* breeds in clean water, which is stored and used for household purposes, as such all the larvicides, which are safe, without any odor or color, have residual effect with low mammalian toxicity and do not pose any health hazard should be used. Temephos, an organophosphate compound meets all the above mentioned requirements and this insecticide is being used under the public health program. The recommended dose for application of Temephos (50 EC) is 1 ppm (1 mg per liter of water).

(ii) Adulticide: The following methods are recommended for the control of adult *Ae aegypti* mosquitoes:

a) Pyrethrum spray: It may be used in indoor situations as space spray at a concentration of 0.1% - 0.2% @ 30-60 ml/1000 cu. ft. Commercial formulation of 2% pyrethrum extract is diluted with kerosene in the ratio of one part of 2% pyrethrum extract with 19 parts of kerosene (volume/volume). Thus, one litre of 2% pyrethrum extract is diluted by kerosene into 20 liters to make 0.1% pyrethrum formulation (ready-to-spray formulation). After dilution, pyrethrum extract is sprayed with Flit pump or hand operated fogging machine fitted with microdischarge nozzle.

b) Malathion fogging or Ultra Low Volume (ULV) spray: In application of ULV, minimum volume of liquid insecticide formulation is applied per unit area. That is, the insecticide is broken down into small droplets of a volume median diameter (VMD) of 40-80 microns with an objective of producing a cloud of insecticide droplets that remain suspended in air for an appreciable time and driven under the influence of wind. This provides maximum effectiveness against target vectors. Since no diluent is used, the technique is more cost-effective than thermal fogging but it does not generate a visible fog. Most organophosphorus insecticides in their technical form can be applied as ULV spray. Under the public health program, ULV

spray (fogging) is undertaken by using 95% or pure technical malathion. The ground equipment mostly used for ULV spray includes portable motorized knapsack blowers and cold aerosol generators.

Legislative Measures

Suitable laws and byelaws should be enacted and implemented for regulating storage/utilization of water by communities, various agencies and avoidance of mosquitogenic conditions at construction sites, factories.

i) *Model civic byelaws:* Under this act fine/ punishment is imparted, if breeding is detected. These measures are being strictly enforced by Mumbai, Navi Mumbai, Chandigarh and Delhi Municipal Corporations.

ii) *Building Construction Regulation Act:* Building byelaws should be made for appropriate overhead / under ground tanks, mosquito proof buildings, designs of sunshades, porticos, etc for not allowing stagnation of water vis-à-vis breeding of mosquitoes. In Mumbai, prior to any construction activity, the owners/builders deposit a fee for controlling mosquitogenic conditions at site by the Municipal Corporation.

iii) *Environmental Health Act (HIA):* Suitable byelaws should be made for the proper disposal/ storage of junk, discarded tins, old tyres and other debris, which can withhold rain water.

iv) *Health Impact Assessments:* Appropriate legislation should be formulated for mandatory HIA prior to any development projects/major constructions.

Health Education for Community Mobilization and Inter-sectoral Convergence

Involvement of household, community for *Aedes* mosquito control is of paramount importance as the problem revolves mainly around man and his environment. There should be a continuous dialogue between health personnel and the community so that people may accept *Aedes* control programs as their own program. Community should be involved in the task of elimination of *Aedes* breeding in and around their houses for keeping houses free of larval breeding and reduction/elimination of adult mosquitoes. Towards these objectives, massive, repetitive, intense and persistent Behavior Change Communication (BCC) campaign is crucial. The community must be assured that this is a preventable disease and empowered with the knowledge about mode of transmission, vector control options, availability of services in addition to correct treatment, so that timely and appropriate action is taken. Special campaigns may be carried out through mass media including local vernacular newspapers/ magazines, radio and TV, especially using local cable networks as well as outdoor publicity like hoardings, miking, drum beating, rallies, etc. Health education materials should be developed and widely disseminated in the form of posters, pamphlets, handbills, hoardings. Interpersonal communication through group meetings, traditional / folk media particularly must be optimally utilized.

At different levels, following action may be taken:

(i) At Household Level:

- *Ae aegypti* mosquito bites during daytime. Adult mosquitoes should be killed by using of commercially available safe aerosols (Pyrethroid-based). Rooms including closets, bathrooms and kitchens should be sprayed (by removing/covering all food items properly) for a few minutes and closing the room for 15-20 minutes. The timing of the spray should coincide with the peak biting time of the *Ae aegypti* mosquito, e.g., early morning or late afternoon.
- Taking personal protection measures like wearing protective clothing (full sleeved shirts & full pants during day time) and using mosquito nets, preferably insecticide treated ones, while sleeping, even during day time. Using commercially available repellents during day time.
- Using mosquito repellents or burning neem leaves, coconut shells and husk to kill or repel the mosquitoes.
- Using tight-fitting screens/wire mesh on doors and windows.
- Intensifying efforts to reduce actual or potential larval habitats in and around houses by:
- Covering all water containers in the house to prevent fresh egg laying by the vector.
- Emptying, drying water tanks, containers, coolers, bird baths, pets, water bowls, plant pots, drip trays at least once each week.
- Regularly checking for clogged gutters and flat roofs that may have poor drainage.
- Introducing larvivorous fishes (e.g., Gambusia / Guppy) in ornamental water tanks/garden. These small fishes eat mosquito larvae.

(ii) At Community Level:

- People should form groups to supplement and reinforce efforts at household level. Such groups can identify commercial activities such as traders dealing in used tyres or small construction projects, etc, which may be creating larval habitats for the vector.
- The Groups should launch awareness campaigns on Dengue and seek cooperation for prevention of mosquito breeding and protection from mosquito bites. Community activities against larvae and adult mosquitoes can include:
  - Cleaning and covering water storage containers.
  - Keeping the surroundings clean and improving basic sanitation measures.
  - Burning mosquito coils to kill or repel the mosquitoes/burning neem leaves, coconut shells and husk to repel mosquitoes and eliminating outdoor breeding sites.
  - Aiding in screening houses.
  - Making available hand aerosols for killing mosquitoes.
  - Cleaning weeds and tall grass to reduce available outdoor resting places for adult mosquitoes near houses.
  - Promoting use of mosquito nets to protect infants and small children from mosquito bites during day time and also insecticide treated nets and curtains to kill mosquitoes attempting to bite through the nets or resting on nets and curtains. Organizing camps for insecticide treatment of community owned mosquito nets/curtains.
  - In case water containers cannot be emptied, applying Temephos (1 ppm) on weekly basis in coordination with the Health authorities.
  - Mobilizing households to cooperate during spraying / fogging.

(iii) At Institutional Level (Hospitals, Schools, Colleges, Other Institutions, Offices, etc):

- Weekly checking for *Aedes* larval habitats especially overhead tanks, ground water storage tanks, air coolers, planters, flower pots, etc
- Ensuring source elimination by:
- Covering all water tanks with mosquito proof lids.
- Emptying, drying water containers, coolers, plant pots at least once each week.
- Checking for clogged gutters and flat roofs that may have poor drainage.
- Introducing larvivorous fishes (e.g., Gambusia / Guppy) in ornamental water tanks/garden.
- Carrying out Indoor Space spraying with Pyrethrum 2%. The timing of the spray should coincide with the biting time of the *Ae aegypti* mosquito, e.g., early morning or late afternoon.
- Carrying out fogging or Ultra Low Volume (ULV) spray by using 95% or pure technical malathion.
- Promoting personal protection measures like wearing protective clothing (full sleeved shirts & full pants during day time), using commercially available repellents during day time as well as mosquito nets, preferably insecticide treated ones, while sleeping, particularly during day time.
- Putting tight-fitting screens/wire mesh on doors / windows.
- In addition, notification of fever cases (suspected/ confirmed) to concerned Health authorities and appropriate case management.

In order to achieve sustainability of successful DF/ DHF vector control program, it is essential to focus on involvement of hospitals, non-health sector departments including schools/colleges, civil society organizations (NGOs, Faith Based Organizations and Community Based Organizations like Residents. Welfare Organizations, Self-Help Groups), Panchayati Raj Institutions/Municipal Bodies or such like local self-governments, local Religious Bodies, Nehru Yuvak Kendras, NSS/NCC units in schools and colleges as well as professional associations like Indian Medical Association and corporate sector. These groups should be provided information on all aspects of Dengue fever/ DHF: what it is, how it spreads and the role of mosquitoes, where & how they breed/rest, and how they can be controlled.

Challenges in Dengue Control

- Multiple implementing agencies involved
- Entomological monitoring & timely interpretation of data
- Enactment of building & civic byelaws (Delhi malaria byelaws 1976 needs to be updated)
- Sustainability of effective community based vector control
- Increased use of non bio- degradable plastics
- Effective interdepartmental coordination on dengue control

- Capturing cases diagnosed in private sector (confirmed/probable)
- Actual disease burden (improved reporting)
- Platelet dependency for case management –CME of doctors on national guidelines
- Coexistence of Chikungunya and threat of Zika transmitted by same vector
- Maintenance of Aedes surroundings of International Airport

References

Badiaga S, Barrau K, Brouqui P, Durant J, Malvy D, Janbon F, et al. Infectio-Sud Group. Imported dengue in French university hospitals: a 6-year survey. J Travel Med. 2003;10:286–9.

Banarjee K. Emerging viral infection with special reference in India. Ind J Med Research 2996; 103: 177-200.

Govt. of India. Annual Report 2006-2007. Ministry of Health & Family Welfare. Nirman Bhawan New Delhi 2006.

Government of India. Investigation & control of outbreaks dengue fever & dengue hemorrhagic fever. Directorate of NVDCP, M/O H&FW, Govt.of India, 22, Shamnath Marg, Delhi-110054.

Govt. of India. Dengue fever / Dengue hemorrhagic fever, Annual Report (2006-2007), M/o H& FW, Govt. of India, New Delhi 2008.

Gupta N et al. Dengue in India. IJ Med Res 2012; 136: 373-90.

Guzman MG, Kouri G. Dengue: an update. Lancet Infect Dis. 2002;2:33–42.

Jelinek T, Mühlberger N, Harms G, Corachán M, Grobusch MP, Knobloch J, et al. European Network on Imported Infectious Disease Surveillance. Epidemiology and clinical features of imported dengue fever in Europe: sentinel surveillance data from TropNetEurop. Clin Infect Dis. 2002;35:1047–52.

Lindbäck H, Lindbäck J, Tegnell A, Janzon R, Vene S, Ekdahl K. Dengue fever in travelers to the tropics, 1998 and 1999. Emerg Infect Dis. 2003;9:438–42.

Okanurak K, Sornmani S, Indaratna K. The cost of dengue hemorrhagic fever in Thailand. Southeast Asian J Trop Med Public Health. 1997 Dec;28(4):711-7.

Oneindia. living.oneindia.in/health/wellbeing/2008/tetravalent-dengue-vaccine-250708.html

Public Health Update. Dengue fever and dengue hemorrhagic fever. Newsletter of IPHA Delhi Branch 2003 Vol 17 (1): 1-4.

Ranbaxy Science Foundation. Dengue Outbreak in Delhi 1996. Round Table Conference Series, No. 1, Dec. 1996.

Schwartz E, Mendelson E, Sidi Y. Dengue fever among travelers. Am J Med. 1996;101:516–20.

Swasth Hind. 50 Years of Health and Family Welfare (Special Issue) Jan 1998.

Times of India. Dengue Fever. Times of India, Sept 4th, 2008.

Wilder-Smith A, Schwartz E. Dengue in travelers. N Engl J Med. 2005;353:924–32.

WHO-SEARO. Health Situation in the Southeast Asia Region 1994-1997. WHO-SEARO, New Delhi 1999.

11F. CHIKUNGUNYA FEVER

Chikungunya word derived from the word "kungunyala" in the Makonde language of southeastern Tanzania and northern Mozambique, which means "to dry up or become contorted". Chikungunya is caused by chikungunya virus, which is classified in the family Togaviridae, genus *Alphavirus* that is spread by the bite of infected mosquitoes. The disease resembles dengue fever, and is characterized by severe, sometimes persistent, joint pain (arthritis), as well as fever and rash. It is rarely life-threatening.

BURDEN OF DISEASE

Global: Chikungunya occurs in Africa, India and Southeast Asia. It is primarily found in urban / peri-urban areas. The first recognized outbreak occurred in East Africa in 1952-1953. Soon thereafter epidemics were noted in the Philippines (1954,1956 & 1968), Thailand, Cambodia, Vietnam, India, Burma and Sri Lanka. Since 2003, there have been outbreaks in the islands of the Pacific Ocean, including Madagascar, Comoros, Mauritius, and Reunion Island. In January 2006, in an epidemic that is currently ongoing on Reunion Island, over ten thousand cases have been reported. It is suspected that many cases of chikungunya are either misdiagnosed or go unreported.

Chikungunya as an reemerging disease

Chikungunya fever has been reported from several other countries like Comoros, Mauritius, Reunion and Seychelles after an interval of more than 20 years,. Countries in the South-East Asia Region like Indonesia, Maldives, and Sri Lanka have also been swept by this emerging infection. now it has established endemicity in several parts of South-East Asia Region. The socioeconomic factors and public health inadequacies that facilitated the spread of this infection continue to exist. There is an urgent need to strengthen national surveillance and response capacity through multisectoral approach and active participation of the communities to prevent and contain this emerging infectious disease.

India was hit in 2006 after quiescence of 32 years. In 2006, more than 1.38 million cases of chikungunya

were reported in India. During 2007, a total of 56365 suspected cases of CHIK have been reported from 14 states and Union Territories (UTs) in India. The state of Kerala alone accounted for 42.7% of the cases.

Factors for resurgence of chikungunya: Various factors include mutation of the virus, absence of herd immunity, lack of efficient vector control activities, globalization and emergence of Aedes albopictus, in addition to Aedes aegyptii as an efficient vector for chikungunya virus (Kalantri et al 2007).

CHIK surveillance in India

The National Vector Borne Diseases Control Program undertakes surveillance of suspected CHIK cases through a network of 40 hospital-based sentinel surveillance centers supported by 13 apex laboratories. As per the national policy, 10% of the suspected cases should be confirmed for CHIK by appropriate laboratory tests. In 2007, 11.7% of the suspected cases were investigated and 21.4% of them were confirmed for CHIK cases, which were varies in different states and UTs. The states of West Bengal and Gujarat have not reached the target of 10%, the proportion tested is high in states where there have been less number of cases such as Andhra Pradesh and Goa. Among those tested, the proportion of confirmed cases varies in different states and is high in Tamil Nadu (76.9%) and Maharashtra (46.7%). In comparison to 2006, there has been overall decrease of 95.9% of reported suspected cases in India.

No cases was reported from Madhya Pradesh, Andaman & Nicobar Islands and Pondicherry as compared to 2006 when 60,132, 1,549, and 542 cases were reported respectively from these three states/ UTs. Considering the epidemic nature of the diseases, it is possible that these figures represent the situation in the A&N Islands and Pondicherry, however it will need to be further investigated at least in Madhya Pradesh. It could be related to decreased reporting or inability of surveillance system to detect the cases. In 2010, 2011 and 2012 there were 48126, 20402 and 15978 suspected cases reported.

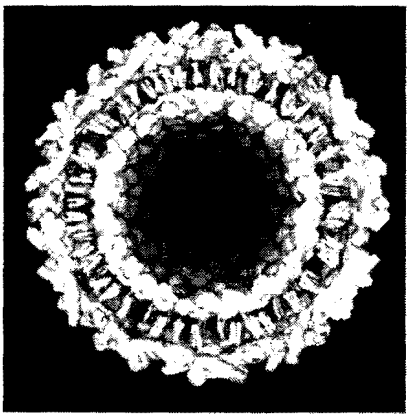


Figure 11 F.1: Chikungunya Virus

The states affected with chikungunya fever during the current year are Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra, Madhya Pradesh, Gujarat and Kerala.

Socio Economic Impact of Chikungunya

Chikungunya has tremendous socio- economic impact. During the epidemics, school attendance drops, productivity at work declines sharply and agriculture gets affected as farmers cannot tend to their crops. Daily wagers lose their wages because of inability to work. Several studies have highlighted the impact of a debilitating infection in working populations and its particular impact on those from low socioeconomic backgrounds. Anecdotal evidence suggests that families of patients such as farm laborers or those working for a daily wage were often deprived of meals because of reduced income. Children also suffered when affected mothers were unable to care for their daily nutritional requirements. Poverty is an important determinant of chikungunya infection, and, further, that chikungunya infection exacerbates the problems of poverty. Poor people are most commonly affected, and as a high proportion are in the productive working age group, with symptoms in many lasting for over 2 weeks, many suffer a lack of income as a result (Kumar et al 2007).

Transmission: Chikungunya is spread by the bite of an *Aedes* mosquito, primarily *Aedes aegypti.* Humans are thought to be the major source, or reservoir, of chikungunya virus for mosquitoes. Therefore, the mosquito usually transmits the disease by biting an infected person and then after certain period biting someone else who is healthy. An infected person cannot spread the infection directly to other persons (i.e. it is not a contagious disease). *Aedes aegypti* mosquitoes bite during the day time.

The *Aedes* mosquitoes that transmit chikungunya breed in a wide variety of man-made containers which are common around human dwellings. These containers collect water, and include discarded tyres, flowerpots, old oil drums, animal water troughs, water storage vessels, and plastic food containers. Lack of public health infrastructure and all factors that promote uncontrolled mosquito breeding are conducive to outbreaks of chikungunya, or other mosquito borne diseases.

The Agent

Chikungunya is caused by a virus (CHIKV), also known as *Buggy Creek Virus* belonging to the Genus Alphaviruses of the family Togaviridae. It is an enveloped, positive-strand RNA virus capable of replicating in mosquito species (Figure 11F.1). It is responsible for an abrupt onset, characterized by joint pains, muscle aches, headache, and rash. The virus was first isolated between 1952-1953 from both man and mosquitoes during an epidemic of fever that was considered clinically indistinguishable from dengue, in the Tanzania. However, epidemics of fever, rash and arthritis, resembling Chikungunya fever have been recorded as early as 1824 in India and elsewhere.

Diagnosis

Chikungunya is associated with leukopenia, anaemia and serum aminotransferase elevation. However, none of these features are specific for the diagnosis. The diagnosis mostly remains clinical.

The specific diagnosis of chikungunya can be obtained by serological tests, molecular methods or viral cultures. Serological tests detect anti-CHIK antibodies (suggested cut-off levels: IgM >0.15 and IgG >0.10) using IgM capture enzyme-linked immune- sorbent assay (ELISA). However, anti-CHIK IgM antibodies appear only 4.5 days after the onset of fever, and fever would have subsided in most cases by then access the sophisticated laboratory tests needed to confirm or exclude the diagnosis.

Molecular diagnosis of chikungunya by RT-PCR has come into vogue recently. The only laboratories in the country to offer chikungunya diagnostic tests—the National Institute of Virology (NIV) and National center for Diseases Control (NCDC).

Clinical Presentation

The time between the bite of a mosquito carrying chikungunya virus and the start of symptoms ranges from 1 to 12 days. Chikungunya usually starts suddenly with fever, chills, headache, nausea, vomiting, joint pain, and rash. In Swahili, chikungunya means that which contorts or bends up. This refers to the contorted (or stooped) posture of patients who are afflicted with the severe joint pain (arthritis) which is the most common feature of the disease. Frequently, the infection causes no symptoms, especially in children. While recovery from chikungunya is the expected outcome, convalescence can be prolonged and persistent joint pain may require analgesic (pain medication) and long-term antiinflammatory therapy. Infection appears to confer lasting immunity.

Treatment: There is no specific treatment for chikungunya. Supportive therapy that helps ease symptoms, such as administration of nonsteroidal antiinflammatory drugs, and getting plenty of rest, may be beneficial. Aspirin should be avoided. Infected persons should be isolated from mosquitoes in as much as possible in order to avoid transmission of infection to other people.

Prevention

There is neither chikungunya virus vaccine nor drugs are available to cure the infection. Prevention, therefore, centers on avoiding mosquito bites. Eliminating mosquito breeding sites is another key prevention measure. To prevent mosquito bites, do the following:

- Use mosquito repellents on skin and clothing.
- When indoors, stay in well-screened areas. Use bed nets if sleeping in areas that are not screened or air-conditioned.
- When working outdoors during day times, wear long-sleeved shirts and long pants to avoid mosquito bite.

Controlling *Aedes* mosquito breeding

(a) Source reduction Method

(i) By elimination of all potential vector breeding places near the domestic or peridomestic areas.

(ii) Not allowing the storage of water for more than a week. This could be achieved by emptying and drying the water containers once in a week.

(iii) Straining of the stored water by using a clean cloth once a week to remove the mosquito larvae from the water and the water can be reused. The sieved cloth should be dried in the sun to kill immature stages of mosquitoes.

(b) Use of larvicides

(i) Where the water cannot be removed but used for cattle or other purposes, Temephos can be used once a week at a dose of 1 ppm (parts per million).

(ii) Pyrethrum extract (0.1% ready-to-use emulsion) can be sprayed in rooms (not outside) to kill the adult mosquitoes hiding in the house.

(c) Biological control

(i) Like introduction of larvivorous fish, namely *Gambusia* and Guppy in water tanks and other water sources.

References

NICD. Chikungunya. National Institute of Communicable Diseases, DGHS, Government of India, New Delhi : 2006.

Kalantri S. P, Joshi R, Riley W Chikungunya epidemic: An Indian Perspective..The National Medical Journal of India 2007; 19 (6).

Kumar C et al. The socioeconomic impact of the chikungunya viral epidemic in India, Open Medicine, 2007; 1 (3):

11G. NIPAH

INTRODUCTION

Nipah virus, of the family *Paramyxoviridae* and the genus *Henipavirus*, is a zoonotic virus that causes outbreaks of fatal encephalitis (Chua et al 2000). It was discovered in 1999 in Malaysia after an outbreak involving mainly pig farm and abattoir workers. The virus was believed to spread from *Pteropus* fruit bats, its natural hosts, to pigs; and having been amplified in pigs, subsequently spread to humans (Chua et al 2002). The first outbreak occurred in the Kinta valley of peninsular Malaysia in September 1998, and in December of the same year, spread to the Bukit Pelanduk pig farms south of Kuala Lumpur.

By the end of the outbreak in May 1999, it had spread to three states in peninsular Malaysia and neighboring Singapore, devastated a multimillion dollar pig farm industry, affected some 265 patients and eventually caused 105 deaths with some 10% of survivors suffered from relapsed disease more than 4 years later (Chua et al 2002) Chua et al 2003, Chong et al 2000, Tan et al 2002, Chong et al 2003). The case-fatality ratio of the disease was 38%–75% (Kumar 2003).

In 2001, two outbreaks occurred in Meherpur, Bangladesh and in Siliguri, neighboring West Bengal state, India. This was followed by outbreaks in Naogaon (2003), Rajbari and Faridpur (2004), Tangail (2005), Thakurgaon and Kushtia (2007) (Chong et al 2008, Hossain 2008), Manikgonj and Rajbari in 2008 (Quddus 2004, ICCDRB 2008), all in Bangladesh. There are many similarities between the outbreaks in Bangladesh and India, and that in Malaysia /Singapore, both resulting in acute fatal encephalitis, and the reservoir of the virus is from the *Pteropus* fruit bats. There are substantial differences as well, especially in the epidemiology and clinical features of the disease.

Epidemiology

The most obvious and perhaps most important epidemiologic difference in the Malaysian and the Bangladesh/Indian outbreaks is the fact that whereas the disease spread mainly from pig-to-human in the Malaysian outbreak (Chua et al 1999), bat-to-human through food or animal and direct human-to-human transmissions were the prominent modes of transmission in Bangladesh and India (ICDDRB 2004, Chadha et al 2006, Gurley et al 2007).

In the Malaysian outbreak, though bats were the reservoir of the virus (Chua et al 2003), it was realized very early on that commercially farmed pigs were the main amplifying hosts resulting in the animal-to-human transmission. Even though the virus was found in the respiratory secretion and urine of the patients, screening of more than 338 health care workers with serology and magnetic resonance imaging showed low risk of human-to-human transmission. A study of 113 subjects who lived in close proximity to bats in Malaysia also failed to detect direct bat-to-human infection, including 15 subjects who had close, direct contact with bats and who had previously consumed fruits partially eaten by bats (Chong 2003, Weingartl 2005).24 In the Bangladesh and Indian outbreaks, however, contact with sick patients and the consumption of date palm juice, possibly contaminated by bats secretions were likely to be the main modes of transmission (ICDDRB 2004, 2005, Gurley et al 2007, Luby 2006). The fact that the outbreaks in Bangladesh occurred during the winter months when the date palm juice was harvested gave support to the consumption of date palm juice causing the outbreak

(Luby et al 2006). Other risk factors found to be significant in case control studies were contact with sick cows, contact with a herd of pigs, and climbing trees. The possible reasons for the difference include differences in the genetic make-up of the different strains of virus involved in these outbreaks with more prominent pulmonary disease and infective secretions in Bangladesh and Indian patients, and the use of barrier nursing technique among Malaysian health care workers early in the outbreaks might contributed to prevent person-to-person transmission (Chua et al 2001). It is also possible that the bats shed a higher amount of viable viral particles into the date palm juice through secretions than on the partially eaten fruit (Luby et al 2006). This, however, remains to be proven. The second difference is that the outbreak in Malaysia/ Singapore was on a much larger scale than subsequent ones in Bangladesh and India. There were 265 patients admitted with 105 fatalities in the Malaysian outbreak (Chua et al 2003).

The outbreaks in Bangladesh and India were smaller involving 4 to 36 patients, with the largest outbreak in Siliguri, West Bengal, India, which involved 66 patients.8-18 The reason for this is perhaps due to the fact that in the Malaysian outbreak, the virus spread rapidly among pigs, which then acted as amplifying hosts and transmitted the virus to the farm workers and owners. The prominent pulmonary illness among pigs with their infected secretions probably underlies the high infectivity to other pigs and humans. The size and high density nature of the commercial pig farm industry, which at the time before the outbreak had a standing pig population of about 2.4 millions, contributed to the extent of the outbreak (Weingartl 2005, ICDDRB 2007). In contrast, the pig farming and rearing of other animals in Bangladesh often involved small herds. Animals such as cows and goats were allowed to roam freely. Large scale animal to animal spread of disease was thus unlikely. The outbreaks in Bangladesh and India were believed to occur from bat-to-human through food and animals and human-to-human transmission without an intermediate amplifying host (Hsu et al 2004, ICDDRB 2005, Luby et al 2006). In fact, an extensive search has found no other animal reservoir of the virus in Bangladesh. Thirdly, the outbreaks in Bangladesh and India recur almost annually, while in Malaysia the outbreak has not recurred for the past 10 years. The outbreaks in Bangladesh and India also occurs in widely separated geographical areas, often simultaneously (WHO 2004). Since bats are the only reservoirs, this signifies frequent introduction of the virus from bats to humans. This difference could be explained by the much larger *Pteropus* fruit bat population in Bangladesh, and the close proximity between human and bats habitat in many of the rural villages in Bangladesh. The practice of consuming raw date palm juice (ICDDRB 2005, Luby et al 2006), which is believed to be an important mode for the virus to spread from bats-to-human through food in Bangladesh, is not a custom in Malaysia. On the other hand, there has been active campaign to discourage planting of fruit trees at the vicinity of pig farms since the last outbreak in Malaysia.

References

Bottieau E, Clerinx J, Schrooten W, Van den Enden E, Wouters R, Van Esbroeck M, et al. Etiology and outcome of fever after a stay in the tropics. Arch Intern Med. 2006;166:1642–8

Chadha MS, Comer JA, Lowe L, *et al.* Nipah virusassociated encephalitis outbreak, Siliguri, India. *Emerg Inf Dis* 2006; 12(2): 235-40.

Chong HT, Hossain MJ, Chong TT. Differences in epidemiologic and clinical features of Nipah virus encephalitis between the Malaysian and Bangladesh outbreaks. *Neurology Asia 2008; 13 : 23 – 26*

Chong HT, Kunjapan SR, Thayaparan T, Tong JMG, Petharunam V, Jusoh MR, Tan CT. Nipah encephalitis outbreak in Malaysia, clinical features in patients from Seremban. *Neurol J Southeast Asia* 2000; 5: 61-7.

Chong HT, Tan CT, Goh KJ, Lam SK, Chua KB. The risk of human Nipah infection directly from bats (*Pteropus hypomelanus*) is low. *Neurol J Southeast Asia* 2003; 8: 31-4.

Chong HT, Tan CT. Relapsed and late-onset Nipah encephalitis: a report of three cases. *Neurol J Southeast Asia* 2003; 8: 109-12.

Chua KB, Bellini WJ, Rota PA, *et al.* Nipah virus: a recently emergent deadly paramyxovirus. *Science* 2000; 288: 1432-5.

Chua KB, Goh KJ, Wong KT, *et al.* Fatal encephalitis due to Nipah virus among pig-farmers in Malaysia. *Lancet* 1999; 354: 1257-59.

Chua KB, Koh CL, Hooi PS, *et al.* Isolation of nipah virus from Malaysian island flying foxes. *Microbes Infect* 2002; 4: 145-51.

Chua KB, Lam SK, Goh KJ, *et al.* The presence of Nipah virus in respiratory secretions and urine of patients during an outbreak of Nipah virus encephalitis in Malaysia. *J Inf* 2001; 42: 40-3.

Chua KB. Nipah virus outbreak in Malaysia. *J Clin Virol* 2003; 26: 265-75.

Gurley ES, Montgomery JM, Jahangir Hossain M, *et al.* Person-to-person transmission of Nipah virus in a Bangladeshi community. *Emerg Inf Dis* 2007; 13(7): 1031-7.

Harcourt BH, Lowe L, Tamin A, *et al.* Genetic characterization of Nipah virus, Bangladesh, 2004.

Hossain MJ, Gurley ES, Montgomery JM, *et al.* Clinical presentation of Nipah virus infection in Bangladesh. *CID* 2008; 46: 977-84.
Hsu VP, Hossain MJ, Parashar UD, *et al.* Nipah virus encephalitis reemergence, Bangladesh. *Emerg Inf Dis* 2004; 10(12): 2082-7.
ICCDR,B. Outbreaks of Nipah virus in Rajbari and Manikgonj, February 2008. *Health and Science Bulletin* 2008; 6(1):12-13.
ICDDRB. Nipah encephalitis outbreak over wide area of Western Bangladesh, 2004. *Health and Science Bulletin* 2004; 2(1): 7-11.
ICDDRB. Nipah virus outbreak from date palm juice. *Health and Science Bulletin* 2005; 3(4): 1-5.
ICDDRB. Outbreaks of encephalitis due to Nipah/ Hendra-like viruses, Western Bangladesh. *Health and Science Bulletin* 2003; 1(5): 1-6.
ICDDRB. Person-to-person transmission of Nipah infection in Bangladesh, 2007. *Health and Science Bulletin* 2007; 5(4): 1-5.
ICDDRB. Person-to-person transmission of Nipah virus during outbreak in Faridpur district, 2004. *Health and Science Bulletin* 2004; 2(2): 5-9.
Kumar S. Inadequate research facilities fail to tackle mystery disease. *BMJ* 2003; 362: 12. [news extra].
Luby SP, Rahman M, Jahangir Hossain M, *et al* Food borne transmission of Nipah virus, Bangladesh. *Emerg Inf Dis* 2006; 12(12): 1888-94.
Mohd Nor MN, Gan CH and Ong BL. Nipah virus infection of pigs in Peninsular Malaysia. *Rev Sci Tech Off Int Epiz* 2000; 19(1): 160-5.
O'Brien DP, Leder K, Matchett E, Brown GV, Torresi J. Illness in returned travelers and immigrants/refugees: the 6-year experience of two Australian infectious diseases units. J Travel Med. 2006;13:145–52.
Quddus R, Alam S, Majumdar MA, *et al.* A report of 4 patients with Nipah encephalitis from Rajbari district, Bangladesh in the January 2004 outbreak. *Neurol Asia* 2004; 9: 33-7.
Tan CT, Goh KJ, Wong KT, *et al.* Relapsed and late-onset Nipah encephalitis. *Ann Neurol* 2002; 51: 703-8.
Weingartl H, Czub S, Copps J, *et al.* Invasion of the central nervous system in a porcine host by Nipah virus. *J Virol* 2005; 79(12): 7528-34.
WHO. Nipah virus outbreaks in Bangladesh, January – April 2004. *Wkly Epidemiol Rec* 2004; 76: 161-72.

11H. LEPTOSPIROSIS

INTRODUCTION

India with an 8129 km long coastline has one of the major important coastal, agro-ecosystem. Due to the rapid ecological changes (reclamation of wastelands, afforestations, irrigation changes in crops and agricultural technology) in the region during the past decade many new zoonotic diseases have emerged and resulted in epidemics. Leptospirosis is one among them. The outbreaks of leptospirosis have been reported from Goa, Orissa and coastal districts of Gujarat, Maharashtra, Kerala, Tamil Nadu, Andhra Pradesh, Karnataka, and Andamans.

EPIDEMIOLOGY

Leptospirosis is primarily a disease of animals, occasionally infect humans caused by spirochete of genus leptospira having two species namely *L.interrogans* and *L.biflexa.* Leptospira strains are divided into 23 subgroups; each subgroup containing several strains. Overall more than 260 host adopted serovars are carried naturally. The serovars predominantly present in India are *L andamana, L pomana, L grippotyphosa, L hebdomadis, L semoranga, L javanica, L autumnalis, L canicola.* Factors responsible for emergence of leptospirosis:

- Reservoir and carriers-natural rodent and non rodent reservoir hosts (foxes, rabbits, etc) and carriers (domestic animals like cattle) excrete organisms in their urine.
- Drainage congestion and water logging force rodent population to abandon their burrows thus contaminating stagnant water by their urine.
- Favorable environment for survival of the organism-soil salinization, lower base saturation of soil, mean annual temperature of 22 degree Celsius or more at 50 cm depth, temperature difference between mean summer and mean winter less than 5 degree Celsius

Transmission: Infection is acquired through contact with the environment contaminated with urine of rodents, carriers or diseased animals.

It occurs more frequently in 20-30 years of age group. Males suffer more frequently because of occupational exposure. Leptospirosis starts at the onset of the rainy season and declines as the rains recede. High risk groups are agricultural workers, fisherman, sewer workers and Lorry drivers and masons.

Spectrum of illness extends from anicteric a mild form to icteric which is severe form of leptospirosis. Severe form is usually occurs in 5-10% characterized by fever, jaundice, usually associated with organ involvement-hepatic and renal (Weil's syndrome), pulmonary (90%)

system. Deaths occur due to pulmonary alveolar hemorrhage and cardiovascular systems. This disease should be differentiated with falciparum malaria, dengue hemorrhagic fever and viral hepatitis. The disease can be diagnosed by: seroconversion, four fold rise in antibody titer, or isolation of leptospires from clinical specimen-blood, urine, CSF, autopsy tissues like kidney or liver. Serological tests for leptospirosis: ELISA and rapid immunodiagnostic tests used for screening and MAT (microscopic agglutination test) is used for confirmation. Laboratories where facilities for diagnosis are available:

- Regional Medical Research Center RMRC, ICMR, Port Blair-744 101
- National Institute of Communicable Diseases (NICD), Sham Nath Marg, Delhi-110054
- Bacteriology & Mycology Division, Indian Veterinary Research Institute, Izatnagar, UP.
- Defence Research & Development Establishment (DRDE), Gwalior (MP).

TREATMENT

PHC (in leptospirosis endemic areas) *Clinically suspect leptospirosis:*

- Tab.doxycycline 100mg BD for 7 days.
- Tab.chloroquine 600mg stat in malaria endemic areas in adults and 10 mg/kg stat in children.
- In children <6 yrs 30 -50 mg/kg/day of Cap. Amoxycillin/Ampicillin in divided doses 6 hourly for 7 days.

Mild disease and rapid immunodiagnostic test positive:

- Injection Crystalline Penicillin 20 lacs IU intravenously 6 hrly for 7 days.
- For children, Injection Crystalline Penicillin 2-4 lakhs IU/kg/day for 7 days.

Negative ELISA and negative rapid immunodiagnostic test and clinically stable

- Tab. Doxycycline 100 mg BD for 7 days.

CHC / District Hospital

For clinically suspect case

- Cap. Doxycycline 100 mg BD for 7 days.
- Tab.Chloroquine 600 mg stat.

In milder form of illness Inj. Crystalline Penicillin 20 lacs intravenous 6 hourly. If the facility of ELISA is not available then following should be given:

- 7 day course of Doxycycline.
- For <6 yrs- Cap. Amoxycillin/Cap. Ampicillin 30-50 mg/kg/day.

Medical College/Tertiary Level Treatment

Any case of fever in leptospira endemic areas during rainy season:

- Tab.chloroquine 600 mg stat; children 10 mg/kg stat.
- Cap. Doxycycline 100 mg BD for 7 days; children <6 yrs- Cap. Amoxycillin/ampicillin.

If there is mild or severe form of illness presented in hospital organ specific care should be given. If ELISA is negative and clinically stable then there is no need of treatment in tertiary hospital. All suspected cases whether positive or negative with rapid immunodiagnostic test having feature of organ dysfunction should be immediately shifted to higher centre.

Prevention and Control

- Protection against contagion by avoiding direct or indirect human contact with animal urine.
- Health education
- Rodent control
- Mapping of water bodies for establishing a proper drainage system
- Health impact assessment of developmental projects.
- Vaccination of animals in endemic situations having high incidence of the disease.
- Leptospirosis should be made e reportable disease in all endemic states.
- Chemoprophylaxis: during peak transmission season: Doxycycline 200 mg, once a week (not more than 6 weeks), may be given to high risk population where clustering of cases has been reported.

References

NICD & WHO. Guidelines for prevention and control of Leptospirosis. Zoonosis Division National Institute of Communicable diseases. New Delhi : DGHS 2006.

CRITICAL REVIEW OF THE NVBDCP PROGRAM

Resurgence of communicable disease such as dengue, chikungunya, malaria, kala-azar, and leptospirosis and indicates the sorry state of Vector Borne Disease Control Program and failure of general health services. This also indicates inability to recognize and regulate the private sector and refusal to acknowledge the complex socioeconomic, cultural and political dimensions of health (Gangolli In. Gangolli 2005). Following critical area are identified:

Comprehensiveness of Program: The preventive strategy was never designed in a comprehensive manner. From time to time problem areas were identified and new strategy was planned, such as Urban Malaria Scheme, Modified Plan of Operation, Malaria Action Program, Enhanced Malaria project, Anti-Malaria Program and now Vector Borne Diseases Control, which is operating under National Rural Health Mission in India. Many a time the name of the program was changed, which may have adverse impact on the implementation at grassroot level. Comprehensive interventions are available and are cost effective. For which a good leadership and teamwork is required.

Tribal and Ignorant Population: In Southeast Asia, there are pockets of tribal and backward areas where educational status of people is poor. The constant movement of tribal people in forests make it difficult to treat individuals and the malaria gametocytes load remains high. Many antimosquito measures are not used in tribal areas. Their knowledge about disease and transmission is also poor. Faith in traditional healers is hindering them to get treatment on time and receive adulterated or inadequate dose treatment. Injection treatment is also preferred in tribals for fever. They believe that convulsion is due to evil spirits, which hinder them to get antimalarial drugs (ICMR 2004). More emphasize on tribal malaria is required in the program.

Environmental Sanitation: Main cause of vector borne disease can be removed by improving the environmental sanitation, which is not emphasized adequately till date. In this case role of other department like environment, civil, engineering, land & building, space and agriculture need to be adequately emphasized.

Political Will: There is hardly any political will to eradicate the disease. People have lost faith on government machinery. Private industries have taken the lead role in exploiting the situation and promoting costly items which have limited role in mitigation of problem at the national level. Sale of repellents has increased many fold and no one know the health implication on its long term use. To utilize the private and public potential the government should implement a comprehensive strategy for control (Kishore 2007).

Community participation: Community participation is essential for the prevention and control of an outbreak of vector borne diseases. The community must be encouraged to take steps to protect themselves from mosquitoes by eliminating mosquito breeding sites and taking personal measures such as use of bed nets, mosquito repellents etc. The cooperation of the community is also important during the periodic insecticide spray.

In pockets of high risk, active search for mosquito breeding sites by the community should be encouraged and early reporting should be ensured. But due to ignorance of the community members this step is never taken in high-risk areas.

Coordinated efforts by government departments such as sanitation, urban development, education etc. are essential so that risk factors for mosquito breeding can be reduced and other control measures taken up effectively. Due to rapid urbanization and improper management of sanitary conditions in rural areas mosquitoes breeding is always a issue of concerned. In an event of an outbreak, the cooperation of other government departments will help to bring it more effectively under control. An interdepartmental committee for outbreak prevention and control should be constituted which should meet more periodically. Many ministries believe that this is the work of health department only.

Lack of community involvement is an important hindrance in achieving the malaria control. The problem of mosquitoes as perceived by people remains same even after huge investment. The awareness

level about disease and mosquito breeding of the urban slum dwellers is not universal and need to be improved through health education in the form of posters and pamphlets distribution (Kishore et al 2004).

Panchayat members, key community representatives and NGOs should be included as members of the committee. A meeting of the committee should be convened before the expected seasonal increase of water and vector borne diseases. In districts where risk factors exist, status of control measures for vector borne diseases and other important diseases should also be assessed.

Diagnosis: For most of the infections the diagnostic facilities are not available at the district or community health center, which hindered early detection and management in absence of good surveillance system. New rapid tests can expand access to accurate diagnosis and treatment but due to cost constraints they are not implemented.

Treatment: Treatment in both the public and private sectors is hampered by low quality of care, inefficiency in service delivery and low utilization of adequate care. Demand is influenced by prices (including travel and time costs of seeking treatment), income, lack of information about appropriate treatment and the difficulties patients have in assessing treatment quality. Supply is affected by inadequate resources, poorly trained staff and inadequate incentives for health workers.

Health Delivery System: Multipurpose workers male are responsible for vector control work in rural areas but unfortunately large number of vacancies in most of the states is real bottleneck in effective implementation. More workers especially for vector control are required.

Surveillance: In South-East Asia Region surveillance of reemerging diseases, vector borne disease is very weak. There is a need of regular surveillance system for infectious and vector borne diseases including those which has potential for epidemic. India has started Integrated Disease Surveillance program in 2005 but in some states it is still not implemented. There is paucity of skilled manpower due to less institutional facilities availability in the region. For vector surveillance many numbers of entomologists, microbiologists and laboratory technicians are required. Similarly field epidemiologists and public health experts are required for effective surveillance.

Research: Application of insecticide should be done judiciously. There is a need to involve social scientists to conduct ethnological fieldwork and to deliver better comprehensive care because they can understand health-related behavior needed for vector control and prevention. Epidemic surveillance and drug resistance monitoring should be established by the government and also promoted in private sector.

In a breakthrough study, scientists at Maryland and South Carolina have come up with a novel four-component vaccine (Live attenuated tetravalent vaccine) that has shown success against all four strains of the dengue virus in monkeys. The new vaccine also holds potential to offer protection to the millions of humans at risk worldwide (Living.oneindia 2008). Brazil to start dengue vaccine production, Brasilia Brazil is to start producing a vaccine against the potentially fatal tropical virus dengue.

Trained Manpower: There is paucity of entomologists at state and national level. In-service training of field workers improves their vector and disease management skills. Such training is not regular features in most of the states and need to be strengthened.

Bednet Program: Use of bednets should be promoted by social marketing and may be introduced in Rural Health Mission/RCH program for delivery of bed nets. Private sector must come forward for marketing bednets in high-risk areas.

References

Gangolli LV, Duggal R, Shukla A. Review of Healthcare in India. Mumbai: Cehat 2005.

Kishore J. A Dictionary of Public Health. New Delhi: Century Publications 2007.

Meltzer, M. et al. Using Disability-Adjusted Life Years to Assess the Economic Impact of Dengue in Puerto Rico: 1984-1994, *Am J Trop MedHyg 1998; 59:* 265-271

Park K. Park's Textbook of Preventive and Social Medicine. 18th Edition. Jabalpur (India): Banarsidas Bhanot Publishers 2005: pp 206.

Wilson ME, Weld LH, Boggild A, Keystone JS, Kain KC, von Sonnenburg F, et al. GeoSentinel Surveillance Network. Fever in returned travelers: results from the GeoSentinel Surveillance Network. Clin Infect Dis. 2007;44:1560–8.

CHAPTER 12

YAWS ERADICATION PROGRAM

INTRODUCTION

Yaws is also named as *framboesia* in German, *buba* in Spanish, *bouba* in Portuguese, *pian* in French, *Parangi* in Sri Lanka, *Purru* in Malaysia, *Coko* in Figi, *Bubas* in Brazil and Dube Gold Coast. In India, the disease is mostly known by the name of the tribe affected most in any region. Some of the common names of yaws are as follows: Madhya Pradesh-*Gondi rog*, *Maria rog*, *Shevaya*, *Aparas*, *Chakawer*; Maharashtra- *Madia rogam*; Andhra Pradesh-*Koya rogam*; Orissa-*Koya rog*, *Bhata phuta*, *Sabaya*; Tamil Nadu-*Peekali mariyerha*, *Urubai kilangomariyerha*; Uttar Pradesh-*Vyadhi, Dakhinia*; and Assam-*Domaru Khahu, Pachwari.*

It is a disfiguring and debilitating non-venereal disease caused by *treponemes pertenue*. It is a highly infectious disease transmitted by direct (person-to-person) contact. Skin shows early lesions, which on healing left little scarring. Disease can be progressive involving bone and cartilage and causing disability. Yaw does not have extra human reservoir of infection and can be cured by single injection of long acting penicillin (Benzathin Benzyl). Yaws occur in remote, hilly and forest areas that have limited acceptability to health care services. Cases of Yaws have been reported from 49 districts in 10 states (Andhra Pradesh, Assam, Bihar, Jharkhand, Gujarat, Madhya Pradesh, Chhatisgarh, Maharashtra, Orissa, Tamil Nadu, and Uttar Pradesh) till 1997.

CLINICAL FEATURES

a) *Primary / early stage* – Primary sore (mother yems) appears as a large papule, about 6 cm in diameter, or as a vesicle on the knee or near the mouth. The scabs becomes macule and later a papilloma. Infective serous fluid exudes from the lesion.

b) *Secondary stage* – After 6-8 weeks rashes resemble a raspberry "framboesia" develop. They fall off without pain. Periosteum and bone may be involved.

c) *Tertiary or later stage*- It occurs after about 5 years or more and is characterized by gummatous lesion near bones and joints. *Gondou*, a swelling by the side of nasal bridge and *gangosa* ulcerative lesion on palate are two special forms of the stage.

Laboratory Diagnosis

Serological tests to detect treponemal antibodies will be useful in diagnosis of yaws only if sexual transmitted syphilis is excluded. Commonly used tests are VDRL test and Rapid Plasma Reagin test.

TREATMENT

Benzathin penicillin G is the drug of choice in a dose of 1.2 million units for all cases and contacts, and half that dose (0.6 million units) for children under 10 years of age. In penicillin sensitive cases, erythromycin or tetracycline is used in recommended doses for a period of 15 days. The WHO recommended 3 modes of treatments:

1. *Total mass treatment:* In areas where yaws is hyperendemic (>10% prevalence of clinically active yaws) treatment is given to all irrespective of disease status of person.
2. *Juvenile mass treatment:* In mesoendemic communities (6%-10% prevalence), treatment is given to all cases and to all children under 15 years of age and other obvious contacts of infectious cases.
3. *Selective mass treatment:* In hypoendemic (<5% prevalence), treatment is confined to cases, their household and other obvious contacts of infectious cases.

The WHO roadmap on neglected tropical diseases, published in January 2012, targets the eradication of yaws by 2020.

National Health Policy 2002

Goal is to "Eradicate Yaws by 2005".

YAWS ERADICATION PROGRAM

The program was started in 1996 with following objectives:

- Interrupting the transmission of yaws infection (no case) in the country,
- Eradication of Yaws (i.e., no sero reactivity to RPR/ VDRL in children below 5 years of age) from the country.

Strategy

1. human resource development;
2. Detection of cases: Active Search operations;
3. Treatment of cases and contacts;
4. IEC involving multi-sectors approach for community awareness; and
5. Monitoring and Supervision: NCDC

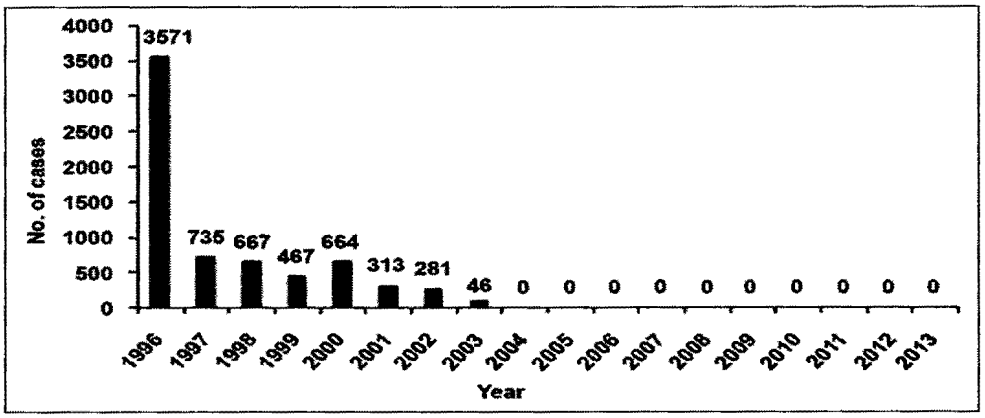
Operation Component

The case detection is being done by making house to house visits by trained paramedical workers and community level functionaries at frequent intervals and treatment of case and contacts simultaneously and immediately after detection. Injection Benzathin penicillin is the drug of choice given in single dose. In penicillin sensitive cases, erythromycin or tetracycline is used in the recommended doses for a period of 15 days. To facilitate the detection of cases, a colored disease recognized card showing different manifestations of the disease (photographs) and other health education materials have been developed.

Program management

The National Center for Diseases Control (NCDC) has been identified as the nodal agency for planning, guidance, coordination, monitoring and evaluation of the program. ***"Yaws cells"*** have been established in Division of Epidemiology to coordinate all activities. The State Health Directorate of yaws endemic states is utilizing existing health care delivery system with the coordination and collaboration of Department of Tribal Welfare and other related institutions. Director General of Health Services, Ministry of Health forms the task force to coordinate and review program. The program has achieved "zero case" status during 2004, 2005 and 2006. Subsequently, India declared interruption of yaws transmission in 2006. Up to 2013, zero cases have been reported, and careful serological surveys have revealed no evidence of transmission (Figure 12.1).

Figure 12.1: Yearwise distribution of cases of yaws in the country.



Past Lession

Yaws and other endemic treponematoses were almost eradicated in the mid-1960s, after WHO and UNICEF jointly led a worldwide campaign in 46 countries between 1952 and 1964. During this period, more than 300 million people were examined and about 50 million were treated with injectable penicillin. By 1964, the prevalence of the diseases had been reduced by almost 95%, making this joint WHO–UNICEF campaign one of the most remarkable success stories in public health.

However, premature integration of yaws and other endemic treponematoses activities into weak primary health-care systems, and the dismantling of the vertical eradication programmes after 1964, led to the failure to finish with the remaining 5% of cases. By the late 1970s, the diseases had resurged in a number of countries, particularly west Africa, prompting the World Health Assembly Resolution 31.58 on the Control of endemic treponematoses in 1978.

While the overall programme was planned, implemented and coordinated by National Centre for Disease Control or NCDC, the program performance at the field level was evaluated by an independent set of experts through appraisal missions. At the highest level, the programme was monitored by a task force under the chairmanship of the Director General of Health Services, Government of India. The sixth mission consisting of 16 teams was undertaken during May and June 2014 and visited 16 districts in 10 States. On 14th July 2016, Regional Office of WHO with Unicef gave validation certificate of Yaws Elimination to Union Minister of Health & Family Welfare in New Delhi.

The experience of India demonstrates that yaws can be eradicated in all endemic countries of Africa and Asia, provided that political commitment can be mobilized and community level activities sustained until the goal is achieved.

References

Govt. of India. Annual Report 2006-2007. Ministry of Health & Family Welfare, Nirman Bhawan, New Delhi Govt of India 2006.

WHO-SEARO. Health Situation in the South-East Asia Region 1994-1997. WHO-SEARO, New Delhi 1999.

CHAPTER 13

NATIONAL LEPROSY ERADICATION PROGRAM

INTRODUCTION

Leprosy is probably the oldest disease afflicting the mankind. Possibly it was originated in Africa and spread very early to India and from there to China. There are references in Buddhist literature. In Vedic reference it is mentioned as "*Kusht Rog*". Kustha in Sanskrit means eating away. It has the maximum social stigma attached to it. A common belief is that leprosy is due to past sins committed by the person. There is a belief that leprosy is hereditary and incurable. There are many misconceptions about disease that causes social aversion and ostracism against leprosy patients leading to the high deformity (Kaur et al 2002). Stigma coupled with physical deformity, reduced productivity and social isolation that grossly increases the level of stress which lead to mental disorders (Verma 1991, Kumar 1980). These patients unfortunately discriminate themselves also (Elissen 1991). A drug "Chaulmoogra" oil was used for leprosy treatment until "Dapsone" was discovered with antileprosy effects during 1940s. But due to scientific inventions leprosy has been identified a disease that can be eradicated. Hansen of Norway during 1873 discovered leprae bacilli, therefore the disease is also known as Hansen's disease. Sulfone drug, e.g. Dapsone was discovered in 1943 for the treatment of leprosy. With the introduction of Multi-Drug Treatment (MDT) during 1981 this disease is very well under control and may be eradicated.

At the global level, the leprosy elimination program is a success story. During the last 15-20 years, the global leprosy caseload has decreased from more than 10 million to about 0.5 million and 113 countries had attained the leprosy elimination goal by December 2003.

EPIDEMIOLOGY

Burden of disease

According to official reports received from 115 countries and territories, the global registered prevalence of leprosy at the beginning of 2006 stood at 219,826 cases, while the number of new cases detected during 2005 was 296,499 (excluding the small number of cases in Europe). The number of new cases detected globally has fallen by more than 111,000 cases (a 27% decrease) during 2005 compared with 2004. It is observed that during the past four years, the global number of new cases detected has continued to decrease dramatically, by about 20% per year.

The South-East Asia Region, with a leprosy prevalence of 1.34/10,000 as on March 2005, remains the only WHO region in the world that has yet to achieve the elimination goal. In this region India contributes the maximum (88%) and in the global burden of leprosy prevalence and new cases in 2003 India contributes 65% and 91%.

The year 2007-08 started with 0.83 lakh leprosy cases on hand as on 1st April 2007, with PR 0.72/ 10,000. 28 States/ UTs had attained the level of leprosy elimination. 487 districts (79.7%) out of

total 611 districts also achieved elimination by March 2007.

After detailed scrutiny, 19 districts as high priority were identified, in which a Situational Activity Plan (SAP-2007) was carried out during the year 2007-08. In 19 states, 275 blocks were identified as high priority where Block Leprosy Awareness Campaigns (BLAC-IV) through intensified IPC were conducted during September - December 2007. Similarly Urban Leprosy Sensitization and Awareness Campaign (ULSAC) was also carried out in 49 urban areas. All these efforts further helped in progressive improvement of leprosy situation in the country.

A total of 1.38 lakh new cases were detected during the year 2007-08, which gives Annual New Case Detection Rate (ANCDR) of 11.70 per 100,000 population. In 2012 there were 1.16 lakh new cases. In April 2008 the Prevalence rate (PR) was 0.74 leprosy cases per 10,000 population. (Figure 13.1). The present prevalence rate is 0.68 per 10,000 population (2012).

Detailed information on new leprosy cases detected during 2012 indicates the proportion of MB (49.71%), Female (36.9%), Child (9.98%), Visible Deformity grade II (3.40%). In previous finding there were ST cases (13.0%) and SC cases (18.9%).

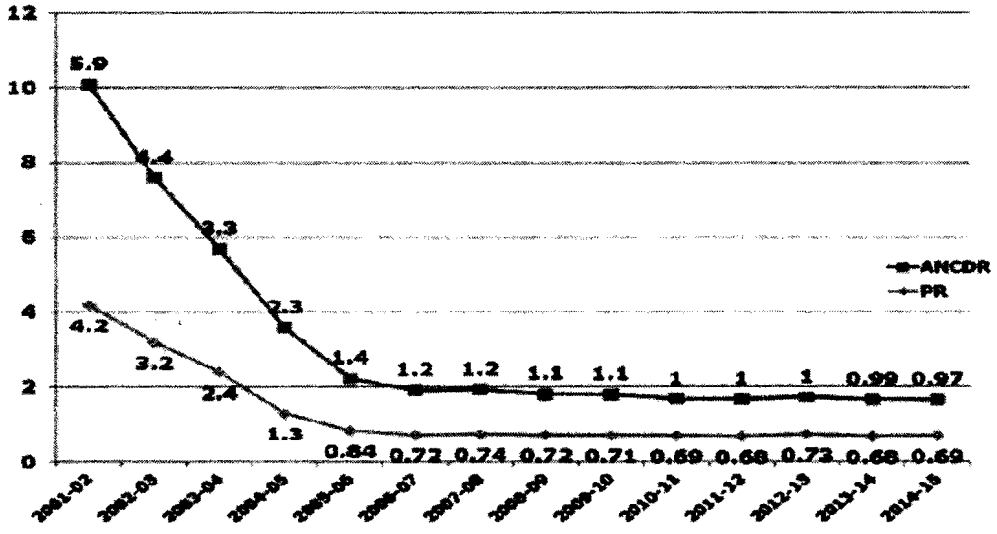
3 States / UTs viz. Bihar, Chhattisgarh, Dadra & Nagar Haveli have PR between 1 and above 10,000 population. These 6 states/UTs with 20.8% of country's population, contribute 33% of country's recorded caseload and 35% of the country's new case detected during the year 2007-08.

29 States/ UTs have achieved the level of elimination i.e. PR less than 1 case per 10,000 population and they include: Nagaland, Haryana, Meghalaya, Himachal Pradesh, Mizoram, Tripura, Punjab, Sikkim, Jammu & Kashmir, Assam, Manipur, Rajasthan, Kerala, Arunachal Pradesh, Daman & Diu, A & N Islands, Pondicherry, Gujarat, Karnataka, Lakshadweep, Tamil Nadu, Andhra Pradesh, Uttaranchal, Madhya Pradesh, Maharashtra , Goa, Orissa , Uttar Pradesh and Delhi. Only Delhi is the new entrant this year. Out of the total 1.33 lakh new cases deleted from records, a total of 1.21 lakh (90.6%) completed their treatment within the specified period and were released from treatment (RFT) as cured during 2007-08.

Causative Factors

Leprosy is caused by *Mycobacterium leprae* bacillus. The mode of transmission and portal of entry of M. leprae is unknown. Airborne (droplet) dissemination of the bacteria is the main source of infection. However, it could be direct skin-to-skin contact, or

Figure 13.1: Trend of leprosy Prevalence (PR) and Annual New Case Detection Rate (ANCDR) in India



Source: NVBDCP. NLEP Newsletter. Jan-March, 2016

mechanical transfer of organisms by fleas, or inoculation by the bed bug or mosquito or a gastrointestinal mode of entry but these routes are very rare. The chance of getting leprosy by talking to a person who has the disease or by eating with them is extremely small. The organisms survive for two to seven days outside the human body. Incubation period of leprosy is ranged between 9 months to 20 years. Leprosy can affect people of any age or sex. However, reporting is delayed in female. Leprosy is more common in areas of poverty, poor nutrition, and overcrowding. Nevertheless, 95% of the people in India are immune to leprosy.

Source of Infection

Not all patients with leprosy are infectious. Undetected and relapsed cases of lepromatous leprosy (LL) and borderline lepromatous leprosy (BL) patients are the main source of infection. In susceptible persons the manifestation of the disease depends on their cell-mediated immunity (CMI).

CLINICAL PRESENTATION

Leprosy usually starts as a patch on the skin, but it can also attack the nerve and damage them. Without appropriate treatment, the nerve damage could be permanent resulting disfiguring of face, hands and feet. Early recognition of leprosy helps in complete treatment and prevention of disabilities. Many of the social problems associated with leprosy could also be avoided by treating cases early.

Diagnosis

Leprosy presents with many symptoms and signs but presence of at least two of the three cardinal signs and presence of fourth sign independently should be sufficient for making the diagnosis:

1. Skin lesion-a hypo-pigmented or copper colored or erythematous skin patch with loss of sensations.
2. Sensory loss- of an individual skin lesion or of an area of the skin supplied by a peripheral nerve.
3. Thickened nerves at the sites of predilection: The ulnar nerve immediately above the ulnar groove; the posterior tibial nerve behind the medial malleolus; the lateral popliteal nerve as it winds round the neck of fibula; the radial cutaneous nerve at the wrist; and the facial and greater auricular nerves; and the median nerve proximal to the flexor retinaculum. In addition, cutaneous branches associated with a lesion may be enlarged. Superficial peroneal nerve is also involved sometimes.
4. Presence of acid-fast bacilli in slit lamp skin smear examination.

Procedure of examination

History Taking: Ask previous medical history of the patient and also assess following questions:

- How long has the skin patch been there? How did it start? Has it changed? Leprosy patches usually appear slowly.
- Do the patches itch? Is there pain? Leprosy patches do not itch and are not usually painful.
- Does the person have unusual sensations in their hands or feet, such as numbness, tingling or a burning feeling? Unusual sensations in the hands or feet can be a sign of leprosy.
- Does the person think that their hands or feet have become weaker? Do they have problems with holding or lifting things and with moving their hands and feet? Losing strength in hands or feet can be a sign of leprosy.
- Has the person experience any social problems? This may be more likely if the person already has some disability due to leprosy.
- Any previous treatment history with MDT because that will help categorization of patient.

Examine the skin: Examine person's whole body taking care of his/her privacy and enough light. Leprosy patches are usually lighter than the surrounding skin; they may be reddish in color and can have a raised edge. Leprosy patches are found in many shapes. Sometimes leprosy is seen as thickening of the skin and there are no skin patches. The skin can be shiny and dry to touch. It may be red than the surrounding skin. Leprosy sometimes causes nodules, or lumps on the skin. They indicate a sign of serious infection. A skin smear taken from a nodule will show a large number of leprosy bacilli.

Test the feeling in the skin patches: First of all patient should be told about the procedure and then the sensation of skin patches should be checked after asking the patient to close eyes. Light touch with cotton wool, the tip of a pen or a similar object is not perceived by the leprosy patches. The procedure should be compared with normal skin. Skin of the face changes and become thick. Other diseases, which present with similar patches and lesions should be ruled out. These are ringworm, pityriasis versicolor, secondary syphilis, etc.

Test Nerves: Enlarged nerves indicate leprosy. Two nerves that are commonly enlarged can be felt quite easily. These are the ulnar and the peroneal nerve. Other nerves such as peroneal, and temporal can also be examined. Nerve damage can lead to loss of feeling in the hands and feet and such person often get wounds and ulcers.

Test four muscles on each side: One muscle controlling the eyelids, two muscles in the hand, and one muscle controlling the foot should be tested. Paralysis of eyelid muscle can cause lagophthalmos. Wrist drop and foot drop are common in leprosy and must be tested.

Check the vision: Due to nerve damage corneal scarring could be developed.

Check for leprosy reactions: Sometime a person with leprosy will experience pain and discomfort because of the body reaction against the presence of leprosy bacilli. These reactions are the main cause of nerve damage and disability in leprosy. These reactions should be immediately treated.

Check for complications of leprosy: In leprosy, patient may develop complications such as damage to the eye, hands and foot due to delay in initiating treatment. Due to loss of sensation fingers or toes do not get pain when they cut or burn. If these wounds are not treated, they get bigger and become infected. This can lead to the loss of fingers or toes. Loss of feeling in the sole of the foot can lead to ulcers unless the foot is protected. The prevention of ulcers and other disabilities resulting from leprosy should be treated with surgical intervention.

Nerve imaging by ultrasound and MRI is useful to find the disability (Rao & Jain 2013).

Disability Grading

It is very useful to assess the disability for start of treatment and to assess the outcome. The WHO grades are given in Table 13.1.

Bacteriological examination of slit-skin smear from skin lesions and ear lobes is sometime need to be carried out because 8-15% of cases shows positive results.

Leprosy Classification

Bacterial Index: It is calculated by totalling the number of positive (+) given to each smear and dividing this number by the smear collected. A minimum of 7 sites should be examined: 4 skin lesions smears, one nasal swab, and both ear lobes smears. Grading of smears for BI (WHO) is as follows:

Negative	:	No bacilli
One +	:	One or less than one bacilli in each microscopic field
Two ++	:	Bacilli found in all fields
Three +++	:	Many bacilli found in all fields

In paucibacillary leprosy the bacterial Index is less than 2 and in the Multibacillary Leprosy it is greater than 2.

Indian Classification of Leprosy

1. Indeterminate Type : One or two vague hypopigmented patch or definite sensory impairment. Bacteriologically negative.
2. Tuberculoid Type: One or two well defined hypopigmented or erythromatous and anesthetic patch may be flat or raised. Bacteriologically positive.
3. Borderline Type: 4 or more flat/raised, well or ill defined, hypopigmented or erythromatous patch with sensory impairment or loss. Bacteriologically positive.
4. Lepromatous Type: Diffuse, infiltrate or numerous flat or raised, poorly defined shiny, smooth, symmetrically distributed lesion. Bacteriologically positive.

Table 13.1: Disability Grading

WHO Grade	0	1	2
Eyes	Normal	Corneal reflex weak	Reduced vision, Lagophthalmos
Hands	Normal	Loss of feeling in the palm of the hand	Visible damage to the hands, such as wounds, claw hands, or loss of tissue
Feet	Normal	Loss of feeling in the sole of the foot	Visible damage to the foot, such as wound, loss of tissue, or foot drop.

5. Pure neuritic Type: Nerve involved but do not have any skin lesion. Bacteriologically negative.

PREVENTION AND CONTROL

The establishment of the Indian Council of the British Empire Leprosy Relief Association in 1925 (Renamed as *Hind Kusht Nivaran Sangh* in 1947) laid the foundation of organized leprosy work in India. The availability of Dapsone monotherapy for leprosy laid the foundation of National Leprosy Control Program in 1955 with the main objective of controlling leprosy through domiciliary treatment with Dapsone. Social obstacles, non-availability of drugs, lack of primary prevention (Vaccination) and leprae resistance to Dapsone have caused program failure. In 1981, Government of India asked the Indian Scientists to develop a leprosy eradication strategy and subsequently launched the National Leprosy Eradication Program (NLEP) in the year 1983 with the objective to eliminate leprosy as a public health problem by the year 2000 AD. Later WHO in 1991 adopted a resolution calling for elimination of leprosy as a public health problem by the year 2000 AD (reducing prevalence to less than one case per 10,000 population).

Milestones of Leprosy Eradication

1898	Leper Act, British India abolish later on
1948	Hind Kusht Nivaran Sangh
1955	National Leprosy Control Program
1982	MDT
1983	National Leprosy Eradication Program (MDT started)
1991	World Health Assembly resolution to eradicate leprosy by 2000AD
1993	World Bank supported the MDT Program Phase - NLEP-1
1997	Mid term appraisal
1998-2004	Modified Leprosy Elimination Campaign
2001-2004	NLEP Project Phase-II
2002	SIS (Simplified Information System)
2005	National Wide Evaluation of Project II
2005, Dec	Prevalence Rate 0.95/10,000 and govt. declared achievement of elimination target
2005	NRHM covers NLEP

NATIONAL LEPROSY ERADICATION PROGRAM (NLEP)

The program was initially taken up in endemic districts and was extended to all districts in the country from 1993-94 with World Bank assistance. Four Research & Training Institutes were established directly under DGHS, namely Central Leprosy Training & Research Institution (CLTRI) Chengalputtu, and Regional Leprosy Training & Research Institute (RLTRI) at Raipur, Gauripur and Aska. In addition a training center was established at Agra under the ICMR. NLEP is continued with GOI funds from Jan 2005 with technical support from WHO and International federation of Anti-Leprosy Association Organization.

National Health Policy 2002

Goal is to "Eliminate Leprosy by 2005".

Objectives:

a. Elimination of leprosy i.e. prevalence of less than 1 case per 10,000 population in all districts of the country.
b. Strengthen Disability Prevention & Medical Rehabilitation of persons affected by leprosy.
c. Reduction in the level of stigma associated with leprosy.

Strategy

To achieve the objectives of the plan, the main strategies to be followed are:

- Integrated leprosy services through General Health Care system.
- Early detection & complete treatment of new leprosy cases.
- Carrying out house hold contact survey for early detection of cases.
- Involvement of Accredited Social Health Activist (ASHA) in the detection & completion of treatment of Leprosy cases on time.
- Strengthening of Disability Prevention & Medical Rehabilitation (DPMR) services.
- Information, Education & Communication (IEC) activities in the community to improve self-reporting to Primary Health Centre (PHC) and reduction of stigma.
- Intensive monitoring and supervision at block Primary Health Centre/Community Health Centre.

Components

The following components are approved in the 12th Plan:

- Case Detection and Management
- Disability Prevention and Medical Rehabilitation
- Information, Education and Communication (IEC) including Behaviour Change Communication (BCC)
- Human Resource and Capacity building
- Programme Management

Under each component following activities are carried out:

Case detection and Management

Proper history followed by thorough clinical examination and laboratory confirmation are important steps of case detection. Certain terms are used in the program defined below:

New Case is defined as a person having skin patch or patches with a definite loss of sensation and has not received a course of MDT.

Old case is the one who has skin patch or patches with definite with or without loss of sensation and has received a full course of MDT.

For the field purpose simple way of detecting leprosy case is given below:

I. Multibacillary Leprosy is labeled when there are six or more skin patches and/ or 2 or more nerves get affected. Skin smear is positive for M leprae at any site.

II. Paucibacillary leprosy (PB) is labeled when there are 5 or less than 5 skin patches and /or one nerve get affected. Skin smear do not show bacilli.

Lepra Reaction: is an inflammation that can affect the skin patches, the nerves, the eyes and, in a few cases, the internal organs. It is due to lepra bacilli. It is characterized by redness, swelling, pain, and heat. It can occur any time in any leprosy patient. They can happen: a) before diagnosis, b) at the time of diagnosis, c) during treatment, and d) after treatment has finished. These are of two types:

a) Type I : Reversal Reaction
b) Type II: Erythema Nodosum Leprosum

Type I or Reversal Reaction: this may occur in both MB and PB leprosy. The patient may present with one or more the following features:

- Skin lesions become reddish and swollen,
- Painful, tender and swollen peripheral nerves,
- Signs of nerve damage-loss of sensation and muscle weakness,
- Fever and malaise sometimes,
- Hands and feet may be swollen,
- Rarely, new skin lesions may appear.

Type II or Erythema Nodosum Leprosum (ENL): The main features are:

- Tender, reddish and transient skin nodules,
- Fever, joint pain and malaise,
- Occasionally painful and swollen nerve,
- Eye involvement may occur.

Table 13.2: MDT doses for Multibacillary adult & Children leprosy patients

Adult	Child 10-14 years	Child 6-9 years
Day 1	***Day 1***	***Day 1***
Monthly Treatment	***Monthly Treatment***	***Monthly treatment***
Rifamipicin 600 mg	Rifampicin 450 mg	Rifampicin 300 mg (10mg/kgbw)
Clofazimine 300 mg	Clofazimine 150mg	Clofazimine 100mg (6mg/kgbw)
Dapsone 100 mg	Dapsone 50 mg	Dapsone 25 mg (2mg/kgbw)
Day 2-28	***Day 2-28***	***Day 2-28***
Daily: Clofazimine 50 mg	Alternate Day: Clofazimine 50 mg	Alternate day: Clofazimine 50 mg (1mg/kgbw)
Daily: Dapsone 100 mg	Daily: Dapsone 50 mg daily	Daily: Dapsone 25 mg

Note: Duration of Treatment for Multibacillary Leprosy: 12 blisters packs to be taken monthly in a period of 12 months. Each patient should be demonstrated for how to take the tablets. First dose of each month should be given in presence of health worker to ensure intake.

Table 13.3: MDT doses for Paucibacillary adult and children leprosy patients

Adults	Child 6-14 years	Child 0-5 years
Day 1	***Day 1***	***Day 1***
Rifamipicin 600 mg	Rifampicin 450 mg	Rifampicin 300 mg (10mg/kgbw)
Dapsone 100 mg	Dapsone 50 mg	Dapsone 25 mg (2mg/kgbw)
Day 2-28	***Day 2-28***	***Day 2-28***
Daily: Dapsone 100 mg	Daily: Dapsone 50 mg daily	Daily: Dapsone 25 mg (2mg/kgbw)

Note: Duration of Treatment for Paucibacillary Leprosy: 6 blisters packs to be taken monthly within a period of 6 months. Each patient should be demonstrated for how to take the tablets. First dose of each month should be given in presence of health worker to ensure intake.

Relapse: a patient who has completed the required course of MDT and who is taken as having been treated, but in whom signs and symptoms of the disease reappear either during the surveillance period or thereafter, is considered to have relapsed. A confirmed case should be treated with MDT again depending upon the classification.

Defaulter: a patient who has not collected treatment for 12 consecutive months. It is however important that adequate efforts should be made to trace and persuade each defaulter to return for assessment and treatment before their removal from the register.

For urban areas

In addition to the leprosy services being provided by Govt. Health facilities, other Health Institutions under the local self Govt., NGO and Private Institutions need to be involved for providing services to the persons affected with leprosy. MDT should be available free of cost in all these Institutions for complete treatment of persons affected. While the District Administration should remain the pivotal agency to manage NLEP in the urban areas, an Urban Leprosy Coordination Committee (ULCC) may be constituted comprising of heads of the institutions from all the organizations providing leprosy services. While Govt. funds will be utilized for providing services in the urban areas, resources available with other organizations should also be utilized for improved management.

Additional activities in urban areas: Component wise activities under NLEP will be carried out in the urban areas as in the case of rural areas. Thus Training, IEC, Procurement and supply of MDT and other required Medicines, MCR Footwear, Aids and Appliances, payments of incentive for RCS etc. will be covered under regular provision. However, it is necessary to carry out following additional activities, which are specific to the needs of the urban population:

(i) Identify human resources available with Govt., Civil societies, NGOs and Private Medical Practitioners for leprosy services like suspect and referral. Population groups may be allocated to each human resource, and for follow up of the cases.

(ii) Build capacity of the identified human resources at the time of induction and periodically.

(iii) Examination of all household contacts of all new cases at least once before the completion of treatment of index case.

(iv) Identify one referral centre in each urban location for diagnosis and to manage leprosy with or without complications.

(v) Supervision and monitoring of the programme is the responsibility of the District Leprosy Officer, and Medical Officer of the referral centre.

(vi) Mobile Health Clinics of General Health services include leprosy services on their visit to slums, peri urban villages and migrant agglomerations.

(vii) Develop a system of record keeping and reporting by each participating Centre.

(viii) Develop a system of regular MDT supply to each Health Centre.

(ix) Procure additional requirement of drugs, dressing material, aids and appliances for inhabitants of leprosy colony requiring regular care for their disabilities.

(x) Organise sensitization meetings for IEC and advocacy, participate in exhibitions, quiz competition for awareness to reduce stigma.

Accredited Social Health Activists (ASHA) will be involved during 12th plan to bring out suspected cases

from their villages for diagnosis at PHC and after confirmation of diagnosis, will follow up the patients for completion of treatment.

The ASHA will be entitled to receive incentive as below:

(i) At confirmation of diagnosis – Rs. 250/-

(ii) On completion of full course of treatment in time – PB - additional Rs.400/

MB - additional Rs.600/-

Activities to be performed by ASHAs:

(i) Search for suspected cases of leprosy i.e. before any sign of disability appears. Such early detection will help in prevention of disability and also cut down transmission potential.

(ii) Follow up all cases for completion of treatment in scheduled time. During follow up visit also look for symptoms of any reaction due to leprosy and refer them to the Health Workers/PHC for treatment. This will again reduce chances of disability occurring in cases under treatment.

(iii) Advise and motivate self-care practices by disabled cases for proper care of their hands and feet during the follow up period. This will improve quality of life of the affected persons and prevent deterioration of disabilities.

(iv) Spreading awareness.

The involvement of ASHAs will be monitored by the concerned PHC Medical Officers. Records of cases referred by ASHAs will be maintained properly and incentive will be paid on time and regular monthly report will be submitted to the District Leprosy Officer.

Leprosy Case Detection Campaign (LCDC)

A unique initiative of its kind under NLEP, will be implemented in high endemic districts of the country, on line with Pulse Polio Campaign by Central Leprosy Division (CLD). All activities related to LCDC will be monitored by CLD and coordinated by States through various subcommittees formed at State and District level. The first LCDC will be conducted in 50 districts of 7 States namely Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha and Uttar Pradesh, from 22 February to 6 March, 2016. To assist the programme at different level for proper monitoring of the cases during treatment period, an Online Reporting System with Patient tracking mechanism (Nikusth) is being worked out with support of NIC. This should help in early data analysis, prompt feedback for action. GIS mapping to study and project geographic distribution of disease is being worked out to further assist in programme monitoring.IEC/BCC and advocacy is an integral part of NLEP since its inception. A workshop was recently held in New Delhi to discuss about the ways and means to further strengthen IEC activities under the programme. A modified IEC/BCC (NLEP Newsletter 2016).

Regular treatment of leprosy cases by providing Multi –Drug Therapy (MDT) at fixed in or centers near to the patient

Multi-drug Therapy (MDT)

Tables 13.2 and 13.3 showed the treatment regime for multibacillary and paucibacillary Leprosy. Among these, rifampicin is the most important drug and therefore is included in the treatment of all types of leprosy.

Drugs used in Leprosy

Rifampicin: is a bactericidal drug and able to kill 99.9% of the viable organisms with the dose of 600 mg. It has a delayed antibacterial effects for several days, during which the organism is incapable of multiplying. The drug is given once a month. Toxic effects have rarely been reported in the case of monthly administration. The urine may be slightly reddish in color for a few hours after its intake. This should be explained to the patient when starting MDT.

Clofazimine: a bacteriostatic and is most active when administered daily but because of its tendency to bind with lipid and cumulative properties the effect of drugs starts late and persists for longer periods. It is well tolerated and virtually nontoxic in the dosage used for MDT. The drug causes brownish-black discoloration and dryness of the skin but although this disappears within a few months after stopping treatment it should, nevertheless, be explained to patients starting the MDT regimen for MB leprosy. Because of its antiinflammatory properties, it is used in type II lepra reactions in higher and divided dosage. It also helps in reducing the dosage of steroids used in the skin and rarely severe gastrointestinal side-effects.

Dapsone: Dapsone is very safe in the dosage used in MDT. Side effects are rare but the main one is allergic reaction, causing itchy skin rashes and exfoliative dermatitis or Stevens Johnson syndrome. Therefore, patients known to be allergic to any of the sulpha drugs

should not be given dapsone. Severe hemolytic anemias are rarely except in patients with glucose-6-phosphate dehydrogenase deficiency.

Other drugs found effective in Leprosy

Thioamides (ethionamide and prothionamide) -are two available bactericidal preparations costlier than Dapsone. Because of their frequently hepatotoxic effect it is not recommended as substitution to Clofazimine.

Fluroquinolones -ofloxacin interferes with bacterial DNA replication by inhibiting the A subunit of the enzyme DNA gyrase. It is less effective than rifampicin and able to kill 99.9% of the viable bacteria when 22 doses are given. Side effects include, nausea, diarrhea, insomnia, headache, dizziness, nervousness and hallucination.

Minocycline-has bactericidal activity against M leprae. This may be because of its lipophilic properties, which allow it to penetrate cell walls. It is less effective than rifampicin.

Macrolides-several members of this group, including erythromycin, have been evaluated as antileprosy drugs, but only clarithromycin shows significant promising results. It is relatively less toxic, and able to kill 99.9% of bacteria in 56 days. Irritation, nausea, vomiting and diarrhea are the most common problems, but they usually do not necessitate discontinuation of the drugs.

Newer drugs options in Leprosy

Drug	Cidal	Static	Cost
Ofloxacin	++	++	Moderate
Moxifloxacin	+++	+++	High
Clarithromycin	++	++	Moderate
Minocycline	++	++	Moderate
Rifapentine	Not done	+++	High
Diarylquinoline	Not done	+++	NA
Linezoilid	Not done	+	High

Disability Prevention and Medical Rehabilitation

Government of India has now approved a plan in which disability care activities of varying grades are to be provided at three levels. Objectives of the program are:

a. Persons with lepra reactions are adequately managed so as to prevent the occurrence of disabilities.
b. Persons with disabilities due to leprosy are assisted with care and support to prevent worsening of their existing disabilities.
c. Persons with deformities suitable for correction are provided reconstructive surgery services through well-distributed specialized centers managed by both government and NGOs.

Factors responsible for Disability

Delayed presentation of leprosy is a significant cause of disability (Bekri et al 1998, Meima et al 1999, Schreuda 1998, Wittenhorst et al 1998, Schipper 1994). Potential causes for delay as came out in these studies were:

1. Lack of awareness of the disease, early symptoms, treatment, etc.
2. Fear of negative social repercussions.
3. Sociocultural view of the disease.
4. Unhelpful advice from family or friends.
5. Reliance on traditional /alternative medicine.
6. Poor access to health services.
7. Ineffectiveness of health services.

Most primary impairments are caused by reactions and neuritis, which can occur before, during and even after MDT is completed. Following risks factors are more associated with nerve impairment: reaction, neuritis, patch over a nerve trunk, patch over the face, borderline type leprosy, pregnancy, postpartum, and delayed treatment or irregular treatment. The first step is to recognize signs and symptoms of leprosy reactions with nerve involvement, and start treatment with prednisolone as quickly as possible (Mahato 2006). The schedule of doses of prednisolone for adult is given (table 13.4.)

Table 13.4: Prednisolone treatment in leprosy reaction

Oral Dose of Prednisolone (1 mg/kg body weight)	Duration
40 mg	1st and 2nd week*
30 mg	3rd and 4th week
20 mg	5th and 6th week
15 mg	7th and 8th week
10 mg	9th and 10th week
5 mg	11th and 12th week

** Continue with the same dose till patient start showing improvement and then start tapping off.*

Most of the reactions are impairment that can be avoided or treated at primary or secondary level of

health services. For reconstruction surgery patient should be referred to higher centers. Not all patients need surgery and in some surgery can be performed.

Use of MCR Sandals

Micro Cellular Rubber (MCR) Sheets are used for the construction of footwear & post operational support for Leprosy, Diabetic and Orthopaedic patients.

Protective footwear is an important component in foot-care. Provision of footwear should be considered as a 'mandatory measure' and not as an extra, optional rehabilitation measure according to a Guideline for leprosy control programs by the Medical Commission of International Federation of Anti-leprosy Association (ILEP), London. MCR Cushioned insole distributes walking pressure more widely over the sole and thus minimize the risk of wounds at pressure sites.

The best way to prevent disabilities is early diagnosis and prompt treatment with MDT. The next step is to recognize signs and symptoms of leprosy reactions with nerve involvement, and start treatment with prednisolone as quickly as possible. Care of eyes, hand and feet is also very important for limiting disabilities. Nerve damage is common in patient who are not taking treatment regularly, or not come to get treatment, or patients with multiple skin lesions and patients with painful or tender or thickened nerves. Such patients may come with various complaints-like nerve pain, painless wounds, blisters or simple with an area where sensation has been lost, difficulty in performing simple tasks like buttoning a shirt, holding a pen, or picking up small objects, or difficulty in walking.

Care of eyes, hands and feet is also very important for limiting disabilities. Regular check ups are required to avoid any organ damage particularly eye, vision, hand and feet. Patient should be informed to avoid injury and for the use of protective implements like gloves, towels, long sticks. Patient should practice safe procedures while cooking, bandage tools handles with cloths to make them safer. Patient should be informed about walking that should be slow and of short distance and preferably using vehicle. He should use MCR footwear. Proper care of skin include keeping it clean, warm, and in case of dryness oil application. Patient should be told about the cleaning of nose, ear and eye.

The Ministry of Social Justice and Empowerment administers fairly large budget for socioeconomic rehabilitation activities and need to be utilized by effective coordination and referral. With the declining cases of leprosy, priority attention also needs to be given to activities for prevention of deformities, and the government should continue additional budgetary provisions for this purpose. Elimination of deformity in leprosy cases would also raise productivity enormously in the country.

An amount of Rs. 8000/- is provided as incentive to each leprosy affected person from BPL family undertaking reconstructive surgery in identify institutions to compensate loss of wages during their stay in hospital. Rs. 5000/- per case is given to the institution for supply and material required for surgery.

IEC and BCC

The IEC strategy during the 12th Plan period will focus on communication for behavioural changes in the general public. Changes are required because:

- Stigma associated with the disease and discrimination against the leprosy affected persons are still perceived. The effective way to deal with this difficult challenge of stigma removal is to embark on intensive Inter-Personal Communication (IPC) with the target groups.
- Certain level of awareness has developed in the communities due to the persistent efforts in communication during last decade. However, continuous efforts are needed to cover the uncovered areas. Coverage will have to move from high risk centric to general community at large.
- For sustaining the anti-leprosy campaign, it is important to integrate leprosy IEC with the IEC of other Health Programmes. This will address the problem of non-availability of technical expertise on communication at various levels of leprosy offices.
- Involvement of people affected by leprosy will also help in improving awareness, case detection and stigma reduction.

IEC under NLEP has been decentralized to the States/ UTs who will make their own plan and implement same. Central Leprosy Division will provide broad guidelines with allotted budget to the States/ UTs, who will have the flexibility to allocate cost to districts as per local **Priority areas** and **Target groups** to be attended through

- Mass Media –TV, Radio and press in local languages.
- Outdoor Media - Hoardings, Bus panels, Wall paintings, posters, Rallies including Banners.
- Rural Media - IPC meetings, School talks/quiz, Folk media, Exhibitions and Health Melas.
- Advocacy - Meetings with Zila Parishad, Mahila Mandals, NGOs etc.

Interpersonal Communication (IPC) through the health staff involving communities, Panchayat leaders and NGO through advocacy workshops will remain the focused approach.

Other activities are as follows:

- Women mobilization
- Old Leprosy Peoples' association
- Complain mechanism will help the leprosy affected persons or others to register or lodge a complain through a *toll free* number in case of discrimination at the workplace, family or society level. Besides the use of IVRS (interactive voice recognition system) will help people to acquire information on leprosy on this toll free information.
- Remedial & redressal measures should be built in IEC campaigns so that the credibility of IEC massages remains high.
- Awareness within the affected persons
- Village level meetings
- Health camps
- Cultural program such as Street theatres, folk music, puppet show, dance theatre, rallies and house visits
- Community feast
- Advocacy meetings
- Sensitization of the media persons
- Motivate the youth to come forward and educate the community about leprosy. Scouts and Guide, NYK volunteers, NCC cadets can take the lead role.
- Inviting budding writers to write positive and motivational stories on leprosy
- Door to door contact and counseling
- Advertisement through local newspapers, posters, wall writing
- Community Newspaper if available should be utilized for spreading such messages. This would give them a sense of oneness and ownership of the program
- Through community radio listening followed by discussions shall help to dispel myths and misconceptions
- Health Melas

Other activities include -

- Hoarding
- Posters and exhibitions.
- Wall painting
- Rallies (including banners etc.)
- Quiz
- Folk Shows
- IPC / advocacy meetings for Influencers/ opinion leaders

Human Resource and Capacity Building

In view of integration of the leprosy services through General Health Care staff, the learning materials for training large number of GHC staff were modified, shortened to 3 days duration, printed and supplied to all States/UTs. Learning material was also prepared and used for ASHAs & POD training. A revised training manual will be prepared for Medical Officers and supplied to all States/UTs.

The Disability Prevention and Medical Rehabilitation (DPMR) component will be major focus in all these trainings for the Medical Officers.

Training for Health Supervisors (Male & Female) and Health Workers (Male & Female) will be carried out regularly every year.

Smear examination to detect Mycobacterium Leprae is one of the important requirement for diagnosis of difficult to diagnose cases. Skin biopsy examination would be required in few cases. Biopsy facilities will be made available in central/regional leprosy institutes and NGO institutions. Now that the district hospitals are being upgraded as referral centre for diagnosis and management of such cases, the laboratory technicians working in these hospitals need to be given specialized re-orientation training under the programme. At least 2 lab technicians from each district hospital laboratory will be trained every year on need basis.

Involvement of ASHAs

- A large number of ASHAs are being engaged at village level under NRHM in the States/UTs. These

workers will be provided training on leprosy at the time of induction. In addition to sensitize them further, one day capacity building at the PHC level will be carried out for ASHAs. Funds under "Services through ASHA" will be utilized for sensitization of ASHA and hence not included separately in the training budget.

- It is proposed to engage Physiotherapist at the District Hospital in a bid to strengthen the Referral Service delivery. These Physiotherapists will be provided training in identified Institutions.
- Training in programme Management, Supervision & Monitoring will be given to the staff of District Cell.

In addition to the short course training given to the different categories of staff, it is necessary that longer duration courses for developing expertise in leprosy diagnosis and case management is necessary. Such trainings were held in pre-integration era at the govt. leprosy institutes viz. the Central Leprosy Teaching & Research Institute, Chengalpattu, and three Regional Leprosy Research and Training Institutes at Raipur, Aska and Gouripur. Such longer duration courses are required for State Leprosy Officers/ District Leprosy Officers.

Updating of leprosy curriculum in under graduate medical course is must. Linkages are to be developed with the medical council of India and medical universities for updating the course curriculum as per programme requirement. Till such time it is necessary to impart NLEP oriented training in Leprosy to fresh medical undergraduates.

Programme Management

The programme will mainly provide services through the General Health care system with supervisory support from the District cell. Supervisory visits will be made by the Central/State level officers & experts drawn from other organization as well. Similarly travel will be made by the consultants from the Central Leprosy Division to various States/UTs.

A National Sample Survey was carried out to assess the leprosy incidence in the country along with the disability load and IEC status, in the year 2010-11 and will be carried out in 2015-16.

Inter personal communication - The effective way to deal with difficult challenge of stigma removal is to embark on intensive interpersonal communication (IPC) with the target groups.

MONITORING AND EVALUATION

Simplified Information System

Management Information system is essential for the monitoring and evaluation of NLEP. Information generated at the local level must be simple so that workers can understand its importance and able to handle it easily. Following ***indicators*** are selected for the simplified information system: a) prevalence rate of leprosy, b) new case detection rate, c) child proportion among new cases, d) visible deformed case proportion among new cases, e) MB proportion among new cases, f) female proportion among new cases, g) new cases detection rate in scheduled castes, h) new cases detection rate in scheduled tribes, i) patient month blister calendar packs stock, j) proportion of health sub-centers providing MDT; and k) absolute number of patients made RFT should also be monitored.

Monthly report form for PHC/Hospital and Dispensary and for district and state is necessary, which is based on ***Patient Care Card***, ***Patient Treatment Record*** and ***MDT Drug stock register***. On receipt of the monthly reports at the level of block PHC, District, State and Center the same is examined by the concerned official immediately. Any shortcoming such as incomplete information, wrong filling up of forms, mistake in calculation and many other should be intimated in writing to the concerned office adducting the requisite correction/clarification immediately. Even reporting with the 'NIL' information must be sent regularly.

The essence of a successful information system is meticulous collection and reporting of correct data. It is therefore important to regularly cross check and validate the data collected and reported. At the subcenter level medical officer or the supervisor would validate the data and at the PHC level block/ district level officer would cross check and validate the report.

Urban Leprosy Control Program

To address the complex problem like larger population size, migration, poor health infrastructure and increasing prevalence in urban areas, there was a need for Urban Leprosy Program. Urban Leprosy Control

program has been implemented since 2005 under which assistance is being provided by Govt. of India to urban areas having population size more than 1 lakh. For the purpose of providing graded assistant, the urban areas are grouped in four categories i.e. Township-I, Medium Cities- I, Medium Cities-II, Mega Cities.

INVOLVEMENT OF NGOS

NGOs are involved in leprosy elimination activities for many decades and their contribution has been a positive impact in reducing the prevalence of leprosy. There are 290 NGOs working in the field of leprosy throughout the country and 54 NGOs are getting grant-in-aid from government of India for Survey Education Treatment (SET) in leprosy. Beside routine activities, some are also providing facilities for hospitalization and disability and ulcer care. Few NGOs are involved in conducting reconstruction surgeries and government is giving @Rs. 2500.00 per surgery and for supply of a pair of Microcellular Rubber (MCR) *Chappal* @ Rs. 160.00 and for MCR insole @ Rs. 40 per sheet.

Involvement of WHO and other agencies

WHO also supports the program by providing anti-leprosy drugs, monitoring, capacity building etc. WHO has undertaken to meet the full requirement of these drugs in India with the assistance of NOVARTIS (Novartis is a multinational company). WHO has supported all the state leprosy cell by providing state NLEP coordinators in 11 states and also zonal NLEP coordinators in the high endemic states of Bihar, Jharkhand, UP, Orissa, and Chhatisgarh.

International Federation of Anti-Leprosy Association (ILEP) is actively involved as partner in the NLEP for the common goal of "A world without Leprosy". In India ILEP is constituted by 10 agencies viz. the Leprosy Mission, Damien Foundation of India Trust, Netherlands Leprosy Relief, German Leprosy Relief Association, Lepra India, Aussatzigenhilfe Emmaus Schweiz (ALES now Leprosy Relief Emmaus Switzerland), Aboriginal and Islander Education Officers (AIFO), American Leprosy Mission and others. ILEP is supporting the program in 19 states with 165 District Technical Support Team covering 267 districts. In addition there are 9 states level technical support teams covering 17 states /UTs. Each support team has one Medical Officer, two NMS/NMA and one driver with vehicle. Their role is redefined recently and has been assigned the job of assisting the districts in integration of Leprosy services with general health care services and their capacity building. The aim of ILEP members working in India is to eradicate the causes and consequence of leprosy by:

* Assisting NLEP to provide sustained leprosy services through general health care system; and
* Strengthening the partnership with those working for the leprosy control program and care of leprosy affected persons.

The activities of ILEP support are (Daniel 2006):

1. Support to sustained building of the GHC staff and production of learning material.
2. Provision of technical support at national, state and district level.
3. Strengthening of an adequate referral system by assisting in developing secondary and tertiary referral system at the district and subdistrict level, for management of leprosy and its complications, including disability care of leprosy affected persons by appropriate capacity building activities.
4. Establishing reconstructive surgery services in the government medical college hospitals.
5. Participating in community education and advocacy.
6. Support to (operational) research covering specific aspects of common concern related to leprosy with focus on clinical, epidemiological and applied research.
7. Support to community-based rehabilitation activities to enable people affected by leprosy gain a sustainable and improved quality of life.
8. Support to NGOs to carry out leprosy services.

The Danish International Development Agency (DANIDA) as a bilateral agency is supporting the leprosy program in India since 1986.

World Bank Support Project

This project has following strategy for Leprosy Elimination in India:

1. Decentralization of NLEP to states and districts.
2. Integration of leprosy services with general health care system.
3. Leprosy training of GHS functionaries.
4. Surveillance for early diagnosis and prompt MDT, through routine and special efforts.
5. Intensified IEC using local and Mass media approaches.
6. Prevention of disability and care.

7. Monitoring and evaluation on regular basis as well as with special efforts such as independent evaluation, leprosy elimination monitoring, annual surveys and validation of elimination, etc.

There are other agencies partner to the NLEP activities: state and UT/governments, community, private medical practitioners, and various concerned government ministries/departments such as information and broadcasting, social justice and empowerment, education, railways, defence/parliamentary, labor and industries, etc.

LEPROSY VACCINE

Prophylaxis Against Leprosy

BCG gives variable efficacy against leprosy in different countries, ranging from 34% to 80%. BCG induced 50% protective efficacy against clinical leprosy, both tuberculoid and lepromatous forms (Karonga 1996) and reimmunization with BCG increased the protective effect by a further 50%. In a meta-analysis summary protective effects in various studies were 43%-62% (Zodpey 2004). None of the study from 28 studies showed any negative effect of BCG on leprosy however, 12 studies demonstrated greater than or equal to 50% efficacy/effectiveness (Zodpey 2006). Therefore BCG immunization of children for tuberculosis can also contribute to leprosy control.

The addition of heat killed M leprae to BCG did not increase the protective effect of BCG in two in Malawi and Venezuela (Karonga 1996, Convit et al 1992) but did in a recent large study in India, resulting in a protective efficacy of 64% (Gupte et al 1998). That study also showed significant protective efficacy (65%) with the cultivable mycobacterium known as Indian Cancer Research Center (ICRC) bacilli. Mycobacterium wether alone or in combination with killed Mycobacterium leprae has been used for vaccine. For Bacille Calmette-Guérin, the vaccine dose is generally that which gives the largest delayed-type hypersensitivity response with minimal side effects. The doses of other integral mycobacterial vaccines appear to be arbitrarily chosen. Hypotheses governing immunologic responses to complex antigens predict that the doses used may be too high, resulting in protection of some individuals and increasing the susceptibility of other individuals to leprosy. The natural history of an individual's prior exposure to environmental mycobacteria will affect the outcome of protective vaccination using a given dose of mycobacterial vaccine in the individual.

Chemoprophylaxis of close contacts of leprosy patients can be an effective control strategy (Smith & Smith 2000). Close contacts of lepromatous cases under 12 years old are given prophylaxis with rifampicin 15 mg/kg once a month for 6 months in UK (Britton & Lockwood 2004).

WOMEN AND LEPROSY

Women with leprosy are in double jeopardy, because not only might they develop postpartum nerve damage, but also they are at particular risk of social ostracism with rejection by spouses and family (Morrison 2000). There is a clear temporal association between the development of type 1 reactions and neuritis and parturition, when cell-mediated immunity returns to prepregnancy intensity (Lockwood 1999). Patients with lepromatous leprosy experienced type 2 reaction (ENL) throughout pregnancy and lactation. ENL in pregnancy is associated with earlier loss of nerve function than in nonpregnant individual. Ideally, pregnancy should be planned when leprosy is well controlled.

COMMENTS

1. *Social Stigma:* "leper" is still a primary symbol for the ostracized person in many culture. High level of self-stigmatization among leprosy patients was observed in the vertical program (Arole 2002). There are various myths regarding leprosy which interfere with the health seeking behavior particularly early detection and treatment (Kishore 2003). Such patients suffer more from mental disorders (Kumar & Verghese 1980). Even in present time people with leprosy have to leave their villages or socially isolated (Senturk 2004) however, the stigma of the disease actually seems to be on the decline worldwide in following areas:
   a. Cure: MDT can cure infected people who are coming back to their normal life;
   b. Deformities and disability are becoming rare and rare;
   c. Contagiousness: 95% of the humanity is naturally resistant to the disease and with treatment the person has little chance of

transmitting it made great impact on people who are dealing with it like family member, professional workers;

d. Segregation: Most of the leper are treated in integrated medical system and gaining self confidence to openly reveal their diagnosis and to speak out;
e. Public education: Changing name from "Leper" to Hensan's disease, new translation of bible have helped reduce some of the religious significance of Leprosy by substituting "Skin Diseases" for the word "Leprosy" in the text (Frist 2000).
f. Major achievement of leprosy control strategy in India indicates the need of more quality services.
g. Yellapukar (1987) and Staples (2007) noted the reluctance of doctors to join the Leprosy program. Those who did so becoming stigmatized by other members of their profession. Postings to leprosy control programs seen as "a punishment", and consequently met with low levels of motivations and antipathy towards the work (Rao 1982). Leprosy workers are not only most disinterested in their work but also exhibit stigma towards the disease (Duggal et al 1988). Leprosy work carried same stigma as the disease itself which is a grave concern. Leprosy workers complaint that government was interested in statistics, where as they were more interested in serving leprosy affected people (Staples 2007).

2. *Leprosy Legislation:* Under the Bombay Prevention of Begging Act 1959 - subsequently extended to cover Delhi-there are clear provisions for the segregation of leprosy affected people arrested for begging and other categories of beggars. Those believed to have leprosy may be removed to a Leper Asylum, either for the term of their detention or, where deemed necessary in order to administer medical treatment, for a longer period. If patient is disabled, but noncontagious still are arrested and incarcerated in state leprosy institutions.

   The Hindu Marriage Act 1955 permits a woman to divorce her husband if he is guilty of rape, sodomy or bestiality, and also cites leprosy-alongside adultery, cruelty and desertion as grounds for divorce.

   The case was brought to court by two men who were elected to a civic body in Orissa in 2003, but were later disqualified as they had leprosy. The Orissa Municipal Act of 1950 bars people suffering from tuberculosis or leprosy from holding such posts. When the case reached to India's Supreme Court that also has uphold a ruling that leprosy patients cannot contest a civic election or hold municipal office in Orissa state (Source: http://news.bbc.co.uk/2/hi/south_asia/7633351.stm). These laws construct leprosy as a highly contagious disease, whereas government is educating people that leprosy is curable is contradictory to one another. Such laws need to be changed urgently.
3. WHO enthusiasm for simplification of Leprosy management could be harmful as skin smears, essential for identifying patients with high bacterial loads, have been discontinued.
4. *Resistant to Leprosy Drug:* Resistance to Dapsone, Rifampicin and Clofazimine drugs is already observed (Petit & Rees 1964, Jacobson & Hastings 1976, Worndroff van Diepen 1982). One should be careful while dealing the leprosy with Multidrug therapy because cases of resistance are now coming with MDT also. If MDT becomes ineffective then one should have some new alternative regimen which is lacking presently with extensive field trial (Dhople 2000). Limiation and benefits of Fixed duration regimen has been explained in detail by Malathi & Thapa (2013) where they suggested alternative regimens also to avoid development of resistance. Drug sensitivity surveillance is urgently needed.
5. *Transmission of infection:* The incidence rate of leprosy tells the transmission of disease, which need to be studied in detail regularly. Elimination campaign is actually a control strategy and this gives false sense of security because target of elimination is less than 1 per 10000. It may come to the same level as it was before if the control measures relaxed. The perception that leprosy has reached an arbitrary point at which it is no longer a public health problem could lead to a reduction in control measures at the very time when further efforts are required (Britton & Lockwood 2004). Leprosy has disputed modes of transmission and

disease transmission is seen in endemic areas with poor socio economic status (inadequate bedding, contaminated water, insufficient diet, etc.).

In the year 2011 a total of 219075 new leprosy cases were registered in the world, of whom 127,295 were in India. In 2012-13 the number increased to 134752 (however, NRHM reported 116022 cases). Among the new cases detected in India approximately 3% have grade 2 disability. It has been estimated that in 2015 there will be nearly 500,000 people in India with grade 2 disability due to leprosy (Alberts et al 2011). New cases among children is not decreasing rather there is slight increase in percentage (9.98).

6. *Elimination Criteria:* It is assumed that below 1 per 10,000 prevalence rate would result in reduction of transmission of M leprae and decrease in incidence of infection and naturally disease will extinct. This assumption is based on the experience of Scandinavian and Western Europe. But this criteria is fundamentally wrong because point prevalence can not be taken proxy indicator for leprosy incidence or transmission. Duration of infection, treatment duration, mortality rate, and cure rate would be affecting the prevalence rate. WHO has already reduced the duration of treatment from 24 months to 12 months, which literally halved the global burden of registered leprosy cases (WHO 1997). If we assumed the reduced prevalence equates to decreased transmission is correct, then we would expect that fewer new cases would be detected as prevalence reduces. However, this has not occurred and the converse is true, with an increase in the number of cases detected in many leprosy endemic countries and districts. In six countries that currently account for almost 90% of new leprosy registrations, incident cases rose between 1995 and 2000 (WHO 2001). This increase has been explained as merely reflecting increased detection of 'backlog' hidden cases through improved outreached services and special campaigns. Although this is likely to be true in certain situations, particularly where patients with advanced disease or disability are detected, it does not adequately explain why children constitute 15% of new cases (WHO 2002). Until a steady epidemiological situation exists with no more 'hidden' cases, leprosy detection rates will not accurately reflect incidence. In seven states and one UT the child proportion is more than 12% in India.
7. *Early diagnosis and treatment:* Ultrasound and MRI are recently being used worldwide to detect the structural changes in peripheral nerves. Unlike MRI, ultrasound is cheap, easily available, less time consuming and can be easily used to follow peripheral nerve along its superficial course. It is useful to detect cases of pure neuritic leprosy, silent neuritis, impending nerve damage during acute reactions and nerve abscess. This non invasive technique may act as a cost-effective tool in early diagnosis of disease as well as reaction. Program should support such development in the diagnosis.

   PCR and reverse transcription-PCR-based techniques have specificity of 100 per cent and a sensitivity of 34 to 80 per cent in paucibacillary patients and greater than 90 per cent in multibacillary patients. Therefore, PCR can provide an excellent adjunct to clinical and histopathological diagnosis of leprosy. PCR coupled with mutation detection analyses rapidly detects drug susceptibility and resistance patterns. Studies have shown that *PARK2/PACRG* gene located on chromosome 6q25-q27 is associated with overall susceptibility of human populations to *M. leprae*. Also, *NRAMP1* located on chromosome 2q35 may be associated with different leprosy types in some populations. Molecular techniques in future can help in rapid case detection even before the appearance of clinical signs and symptoms. Among the various cytokines, C-X-C motif chemokine 10 (CXCL10) and interleukin (IL) 6 are elevated during type 1 reaction, while IL7 and Platelet derived growth factor BB chain (PDGF-BB) represent potential markers of Type 2 reaction (T2R). These cytokines may be useful in early diagnosis of reaction and monitoring response to treatment, but their sensitivity and specificity need to be determined.
8. *Measurement of disability problem:* There is inherent problem of measuring disability due to leprosy being associated with impairment, activities of daily living, stigma, social participation and quality of life. Such information is essential for planning services for prevention of disability and

rehabilitation. Disability is measured by DALY, YLL (Year of life loss), DAWLY) Disability adjusted working life years. But recently other scales are developed such as screening of activity limitation and safety awareness (SALSA), and participation scale which should be used to measure the disability associated with leprosy.

7. *Social factors elimination:* Effort should be made to eliminate the medical and social factors related to leprosy, just not merely the elimination of leprosy itself because other problems or disease will emerge if we do the later thing only.
8. *Integration and diagnosis Problem :* Leprosy control activities are being integrated into general health services and this period of integration requires careful planning and implementation or the needs of leprosy control will be swamped by other pressing health problems, such as HIV/AIDS, and Tuberculosis. It is found that when a disease becomes rare, successful detection by health workers is impaired by lack of diagnostic experience and a decreased index of suspicion (Durrheim 2002). Increasing prevalence of HIV associated dermatological conditions that may mimic leprosy is an additional challenge to early diagnosis (Kumar B 2015). Histoid Leprosy has heavy load of bacilli and can remained active for sometime. Doctors should be expert in detecting them particularly in elimination era. The vacant posts of multipurpose worker (male) is most states need to be filled as the overburdened ANM alone might not be able to devote enough time towards leprosy control activities in the communities.
9. *Decline experts in Leprosy:* Over the last few years involvement of dermatologists in vertical programme has diminished in India and moreover, dermatologists are also now more focused towards lucrative branches of dermatology. Services of dermatologists are essential for making better policies, search of newer drugs, developing the training modules and teaching leprosy management skills to health workers and new generation of medical students.
10. *"Difficult to reach"*: These are border areas, migratory population, urban slums and drop outs. There is a need to launch special program for those groups who are "difficult to reach" because cases are found in cluster. Another difficult region is tribal areas such as Jharkhand, Orissa, and Madhya Pradesh where people are at unrest due to resurgence, people's freedom or other movements, criminalization, etc. Beside this, people are unaware of their disease state and availability of drugs.
11. *Appropriate community health education:* leprosy is treatable before disability occurs, is an important component of leprosy control to promote early presentation before the appearance of impairment of nerve function and disability. However, community education about leprosy is not enough. There is a need to eliminate stigma, social and economic poverty.
12. *Social and Economic Rehabilitation (SER),* which promotes idea that stigma which is not eradicated through education can be challenged through economic development, is the major prong of post-medical work. SER should be treated as synonym of "social aspects of leprosy". A regular income can bring respect and overcome stigma (Nicholls et al 1999). If patient is economically well placed then he is still treated as normal. People won't accept a grossly deformed beggar, but they will accept a grossly deformed millionaire. Business loan schemes are major practical components of the new strategy at the NGO level (Staples 2007), along with house building loan, scholarships and vocational training schemes, but such initiative are still lacking in government programs.
13. *Isolating patients and disabled in leper colonies:* Patients who are suffering from leprosy are isolated in leper colonies and then they remain there forever. They have their families that are more prone to infection and worst environmental conditions. This move does not reduce stigma rather increase their miseries. Slowly these families depend on outside help and live in poverty. Such colonies should be abolished to reduce the stigma.
14. *Factors favorable to eliminate leprosy*: There is a strong international support, with large number of NGOs operating in India ensuring more community and political involvement. We should not further dilute the resources necessary for effective leprosy control. We should focus more on endemic districts and pockets in other districts where elimination level is already achieved.

THE "FINAL PUSH" STRATEGY FOR ELIMINATION OF LEPROSY

The main thrust of the leprosy elimination strategy is to:

- expand Multi Drug Therapy (MDT) services to all health facilities
- ensure that all existing and new cases are given appropriate MDT regimens
- encourage all patients take treatment regularly and completely
- promote awareness in the community on leprosy so that individuals with suspicious lesions will report voluntarily for diagnosis and treatment
- set targets and time table for activities and make all efforts to achieve them
- keep good records of all activities in order to monitor the progress towards elimination.

The global strategy builds on the geographic stratification of the problem, based on epidemiological and operational factors. High priority countries or areas are then identified and targeted.

Intensive and flexible deployment of MDT services to every village is being actively promoted by intensive leprosy elimination campaigns. Targets are being closely monitored by WHO and by individual countries, as they progress along the road to elimination.

DECLARATION AGAINST STIGMA AND DISCRIMINATION 2006

Leprosy is considered of stigma and discrimination due to which patients do not come forward for treatment in early stage. In a joint declaration on the 27th Jan 2006 in New Delhi all the world leaders appeal global people to end stigma and discrimination against people affected by leprosy.

References

Alberts CJ et al. Potential effect of the woorld health organization's 2011-2015 global lepsoy strategy on the prevalence of grade 2 disability: a trend analysis. Bull WHO 2011; 89: 487-95.

Arole S, Prem Kumar R, Arole R, Mary M, Saunderson P. Social Stigma: a comprehensive qualitative study of integrated and vertical care approach to leprosy. Leprosy Review 2002; 73(2): 186-96.

Bekri W, et al. Delay in presentation and start of treatment in Leprosy patients: a case control study of disabled and non-disabled patients in three different settings in Ethiopia. Int J Lepr Other Mycobact Dis 1998; 66: 1-9.

Bharath S, Shamasunder C, Reghuram R, Subba Krishna DK. Correlates of psychiatric morbidity in patients with leprosy. India J Leprosy 2001; 73 (3): 217-228.

Britton WJ, Lockwood DNJ. Leprosy. Lancet 2004; 363: 1209-1219.

Comvit J, Sampson C, Zuniga M, et al. Immunoprophylactic trial with combined Mycobacterium leprae/BCG vaccine against leprosy: preliminary results. Lancet 1992; 339: 446-50.

Daniel J. International Federation of Antileprosy Associations and National Leprosy Eradication Program-An Alliance that Accelerated Quality Leprosy Services. JIMA 2006; 104 (12): 669-670.

Dhillon GPS. NLEP-Current Situation and strategy during the 11th Plan Period (2007-2012). JIMA 2006; 104 (12): 671-672.

Dhople AM. Search for newer anti-leprosy drugs. Ind J Lepr 2000; 72 (1):5-19.

Dua Avtar Singh. Programmes for the control of Leprosy, tuberculosis and malaria. In National Commission on Macroeconomic and Health. Burden of Disease in India. Ministry of Health & Family Welfare Govt. of India 2005.

Duggal R et al. Social aspects of leprosy: Finding from rural Maharashtra. The Foundation for Research in Community Health Bombay 1988;

Durrheim DN, Fourie A, Balt E, et al. Leprosy in Mpumalanga Province, South Africa-Eliminated or hidden? Lepr Rev 2002; 73: 326-33.

Durrheim DN, Speare R. Global Leprosy elimination: time to change more than the elimination target date (editorial). J Epidemiolo Community Health 2003; 57: 316-317.

Elissen MC. Beliefs of leprosy patients about their illness. A study in the province of South Sulawesi, Indonesia. Trop Geog Med 1991; 43 (4 Suppl): 379-382.

Fine PE, Warndoff DK. Leprosy by the year 2000-what is being eliminated? Lepr Rev 1997; 68:201-2.

Frist TF. Stigma and social response to Leprosy: experience of the last half century. Ind J Lepr 2000; 72(1):1-3.

Govt. of India. Annual Report 2006-2007. Ministry of Health & Family Welfare. Govt. of India.

Govt. of India. Leprosy Elimination Monitoring in India 2004. Leprosy Division, DGHS, Ministry of Health & Family Welfare, Govt. of India, New Delhi.

Govt. of India. Report on National Workshop on Disability Prevention and Medical Rehabilitation, New Delhi. Director General of Health Services, Govt. of India 2006; Z16025/4/2006-Lep.

Govt. of India. www.nlep.nic.in/about.html (accessed 13.3.2009)

Gupte MD, Vallishayee RS, Anantharaman DS, et al. Comparative leprosy vaccine trial in south India. Indian J Leprosy 1998; 70: 369-88.

Jacobson RR, Hastings RC. Rifampicin resistant Leprosy. Lancet ii 1976: 1304-1305.

Karonga Prevention Trial group. Trial of BCG vaccine for protection against tuberculosis and Leprosy in Karonga District, Malawi. Lancet 1996; 348:17-24.

Kaur H, Van Brakel W. Dehabilitation of leprosy-affected people-a study on leprosy affected beggars. Leprosy Review 2002; 73 (4 Suppl) 346-355.

Kishore J. Myths and Reality about Leprosy. Rationalist Voice 2003; 3 (1): 13-15.

Kumar A, Anbalagan M. Socioeconomic experiences of leprosy patients. Leprosy India 1983; 55 (2 suppl): 314-321.

Kumar B. World Leprosy Day 2015: Renewing commitment for a leprosy free world! IIndian J Med Res 141, January 2015, pp 1-4.

Kumar JH, Verghese A. Psychiatric disturbances among leprosy patients. An epidemiological study. International J Leprosy Other Mycobacterium Disease 1980; 48 (4): 431-434.

Lockwood DN, Sinha HH. Pregnancy and Leprosy: A comprehensive literature review: Int J Lepr Other Mycobact Dis 1999; 67: 6-12.

Mahato ME. Disability Prevention and Medical Rehabilitation (DPMR)-Prevention of Disability and Timely Referral in Leprosy. JIMA 2006; 104 (12): 682-685.

Malathi M, Thapa D. Fixed Duration therapy in Leprosy: Limitations and opportunities. Ind J Leprosy 2013; 58 (2): 93-100.

Meima A, Saunderson PR, Gebre S, et al. Factors associated with impairments in new leprosy patients: the AMFES Cohort. Lepr Rev 1999; 70: 189-203.

Morisson A. A Woman with leprosy is in double jeopardy. Lep Rev 2000; 71: 128-43.

Nicholls P et al (eds). Guidelines for the Social and Economic Rehabilitation of People affected by Leprosy. International Federation of Anti-Leprosy Association London 1999.

Petit JHS & Rees RJW. Sulphone resistant in Leprosy: an experimental and clinical study. Lancet 1964; 2:673-674.

Rao PN, Jain S. Newer management options in Leprosy. Ind J :Leprosy 2013; 58 (1): 6-11.

Rao KV. Study of Leprosy Control Program in a rural population in Chingleput District. Ph D, JNU New Delhi 1982.

Richardus JH. Leprosy remains an important public health challenge in India. Ind J Med res 2013; 137: 878-79.

Schreuda PA. The occurrence of reactions and impairments in Leprosy: experience in the leprosy control program of three provinces in northeastern Thailand 1987-1995. Int J Lepr Other Mycobact Dis 1998; 66:170-81.

Senturk V, Sag duy A. Psychiatric disorders and disability among leprosy patients: A review. Turk Psikiyatri Derg Full 2004; 15 (3): 236-243.

Smith CM & Smith WC. Chemoprophylaxis is effective in the prevention of leprosy in endemic countries: A systematic review and meta-analysis. J Infect 2000; 41: 137-42.

Staples J. Leprosy and the State. Economic and Political Weekly 2007; XLII (5): 437-443.

Swasth Hind. 50 Years of Health and Family Welfare (Special Issue) Jan 1998.

Tsutsuni A, Izutsu T, Akranul IMD, Ahmed JU et al. Depression status of leprosy patients in Bangladesh: association with self-perception of stigma. Leprosy Review 2004; 75(1): 57-66.

Vlassoff C, Khot S, Raos. Double jeopardy: Women and Leprosy in India. WH Statistics 1996; 49 (2): 120-126.

Yellapukar MV. Problems in NLEP implementation and social science inputs in RK Mutatkar and and SN Morankar (eds). Proceedings of the National Seminar on Social Science Research in Leprosy Gandhi Memorial Leprosy Foundation Wardha 1987.

Worndorff van Diepen. Clafazimine resistant leprosy. A case report. Int J Lepre 1982; 50:139-142.

WHO. Revising Challenges towards the elimination of leprosy (Leprosy Elimination Project). Ind J Lepr 2000; 72 (1): 2000

WHO. Leprosy. Global Situation. Wkly epidemiology Rec 2002; 77: 1-8.

WHO. Leprosy. Wkly Epidemiol Rec 2001; 76: 173-9.

WHO. Shortening duration of treatment of multibacillary leprosy. Wkly Epidemiol Rec 1997; 72: 125-8.

Zodpey S. The BCG Controversy: A reappraisal of the protective effect against tuberculosis and leprosy. Ind J Pub Health 2004; 48 (2): 70-77.

Zodpey S. Application of Case-Control Design and Meta-analysis in resolution BCG controversy. Jabalpur: Banarsidas Bhanot 2006.

CHAPTER 14

GUINEA WORM ERADICATION PROGRAM (GWEP)

INTRODUCTION

Dracunculosis or Guinea Worm (GW) disease is caused by the nematode *Dracunculus medinensis*. The adult female guinea worm, measuring 60-100 cm in length, emerges through the skin, usually lower limbs, causing swelling, ulceration and discomfort to the patients. The GW infection is transmitted to a person when an active GW patient with the ulcer enters into unsafe drinking water-source the anterior end of the emerging guinea worm is ruptured. The contact with water bursts a loop of the uterus discharges its thousand of embryos into water. *Cyclops* present in the water ingests these embryos. When a person drinks water containing infected *Cyclops*, the gastric juice of man kills the *Cyclops* and activates the larvae which then penetrate the gut wall and migrate, usually to the retroperitoneal connective tissues, where they mature into male and female adult worms in about six months after entering into human body. The male worm is smaller in size, dies immediately after copulation and gets absorbed in the body. The female then, migrate to those part of the body which are likely to come in contact with water.

The disease causes incapacitation to the patient who is unable to perform his regular work, resulting in economic and production loss to the family. Presently, it is prevalent in the African continent. During the year 1980, about 45, 000 GW patients were estimated in seven states of India, viz., Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Tamil Nadu. The disease was mostly confined to rural areas with inadequate safe drinking water supply. Peak incidence used to occur in the summer season when there is scarcity of water, except in the desert areas of Western Rajasthan where the incidence was more in post-monsoon season.

India is the first country in the world to establish the National Guinea Worm Eradication Program during 1983-84 as a centrally sponsored scheme on 50:50 sharing basis between Center and States with the objective of eradicating guinea worm disease from the country. The National Institute of Communicable Diseases (NICD), Delhi worked as the nodal agency for planning, coordination, guidance and evaluation of NGWEP in the country.

Strategy

The important strategy adopted to eradicate the GW were:

1. GW case detection and continuous surveillance through active case search operations and regular monthly reporting.
2. GW case management.
3. Vector Control by the application of Temephos in unsafe water sources eight times a year and use of fine nylon mesh/double layered cloth strainers by the community to filter Cyclops in all the affected villages.
4. Health education, particularly about filter of drinking water and also protecting water source

from infestation by through physical contact.
5. Manpower development.
6. Provision and maintenance of safe drinking water supply on priority in GW endemic villages.
7. Regular monitoring and evaluation.
8. Partnership and networking between the government, UNICEF, WHO, NGOs, and other health agencies.

Implementation

The endemic State Health Directorates through Primary Health Care system had implemented the program. The Ministry of Rural Development, Govt. of India and State Public Health Engineering Departments (Rural Water Supply) had assisted the program in provision and maintenance of safe drinking water supplies and conversion of unsafe drinking water sources, like step wells, and ponds on priority in the guinea worm affected areas. District Medical Officer and PHC Medical Officer were responsible for planning, implementation, monitoring and supervision of the GWEP. Annually the Task Force Group under the chairmanship of Director General Of Health Services, Govt. of India, reviewed the GWEP in depth. This Task Force Group was constituted by: a) Director and Deputy Director (Helminthology) of NICD Delhi as convener and coordinator of the work, b) Directors of Health and Medical Services, GWEP-officers, chief engineers (Rural Water Supply) of GW endemic states, c) Director/Advisor of National Water Mission as member, and d) Experts from WHO, UNICEF, Center Health Education Bureau (CHEB), Planning Commission and related organizations.

Achievement

At the beginning of the program i.e. in 1984, there were around 40,000 GW cases in 12,840 villages in 89 districts of 7 endemic states. During 1996 only 9 guinea worm cases have been recorded in three villages from Jodhpur (Rajasthan), rest of the country continued to remain free from GW. Banwari Lal 25 years old from Jodhpur in Rajasthan was the last case in India in 1996 (Lancet 2000). "Zero" incidence has been maintained since August 1996 through active surveillance and intensified field monitoring in the endemic areas.

In the Meeting of WHO in February 2000 the India has been certified for the elimination of Guinea Worm Disease and on 15th February 2001 declared India as "Guinea Worm Disease Free".

However, WHO recommended following activities should be continued as per recommendations of International Commission for Certification of Dracunculiasis Eradication, Geneva:

1. Health education with special emphasis on school children and women in rural areas;
2. Rumor registration and rumor investigation;
3. Maintenance of guinea worm disease on list of notifiable disease and continuation of surveillance in erstwhile endemic areas.
4. Careful supervision of the functioning of hand pumps and other sources of drinking water, and provision of additional units wherever necessary

In seven endemic states covering 89 districts of India are under GW disease surveillance namely Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Tamil Nadu.

References

Govt. of India. Annual Report 2006-2007. Ministry of Health & Family Welfare. GOI, New Delhi, India.
Lancet 2000; 355:212 (News).
WHO. Health Situation in The SEARO 1998-2000. WHO 2002.

CHAPTER 15

RABIES CONTROL PROGRAM

INTRODUCTION

Rabies is perhaps the most dreadful of all communicable diseases and carries almost 100% mortality if no preventive measures taken on time. Man gets this disease through bite of rabid animals, mainly dog. Rabies is also known as hydrophobia, is an acute viral disease of nervous system; and is caused by Lassa virus type I. Rabies does not exist in many countries, e.g., Guyana Jamaica and Uruguay in Americas, Oman, Qatar, Japan in Asia, Great Britain, Scandinavian countries, Spain, Portugal, Australia, etc. On the other hand, it is prevalent in many countries including India. Of two epidemiological cycles of rabies viz. urban and sylvatic, the former accounts for almost 99% of the mortality and morbidity in India. Rabies present throughout the country except in the islands of Lakshadweep and Nicobar.

BURDEN OF DISEASE

Canine rabies causes approximately 59,000 (95% Confidence Intervals: 25-159,000) human deaths, over 3.7 million disability-adjusted life years (DALYs) and 8.6 billion USD economic losses annually. The largest component of the economic burden is due to premature death (55%), followed by direct costs of post-exposure prophylaxis (PEP, 20%) and lost income whilst seeking PEP (15.5%), with only limited costs to the veterinary sector due to dog vaccination (1.5%), and additional costs to communities from livestock losses (6%). The overwhelming majority are in Asia and Africa: India alone accounts for 20,847 deaths, more than one-third of the world's total, giving it the highest incidence of rabies globally. The annual animal bite load is estimated to about 17.4 million (1.7%) and 46.9% takes antirabies vaccination (Sudarshan 2005). The main biting animal is dog (91.5%) and others are cat, cattle, goats, horses, mongoose, and jackals; mainly in lower limb (56.2%), upper limb (20.9%) and rest of other part. Bite is more in males than females. The overwhelming, number of victims belongs to 1-24 years of age group, more serious bites are inflicted on the upper part of the body. It is recorded that a single rabid dog is capable of biting 60-100 human beings and animals and can cover up to 45 kms in short span of clinical illness.

Unfortunately, less than fifty percent wash their wound with soap and water and around 20%-40% follows indigenous and religious remedies such as applying chilli (red) and oil, tie a bell at temple, etc. to get ride of rabies (Sudarshan et al 2006). Awareness about rabies is also very poor (Singh & Choudhary 2005). Around 45-60% of patients with rabies had tried indigenous treatment. About 50.6% died at home and autopsy was not done. Hydrophobia and aerophobia were the prominent clinical features among them. The nerve tissue vaccine (NTV) formed the mainstay of treatment (47%), Tissue Culture Vaccine was 30-42% and Rabies immunoglobulin use was just 2%.

There are reports indicating that problem of rabid dogs

is increasing due to increase in the dog population. Post exposure treatment of bite costs Rs. 252.00 and results in a loss of 2.2 days of work, i.e. 17.4 million animal bites would cause loss of 38.8 million work days and would cost Rs. 4384.8 million for treatment. Much more loss would be if cattle deaths, human and animals suffering are also included. A comprehensive program is required to prevent the loss in terms of loss of livestock, suffering of humans and animals bitten by rabid animals, and money spent in the post-exposure treatment. Such program does not exist in India except in few metropolitan cities and states.

PRE-EXPOSURE PROPHYLAXIS (PEP)

PEP is offered to high risk groups like laboratory staff handling the virus and infected material, clinicians and paramedics attending to hydrophobia cases, veterinarians, animal handlers and catchers, wildlife warders, quarantine officers and travelers from rabies free areas to rabies endemic areas. PEP should be three full Intramuscular (IM) doses of Purified Chick Embryo Cell Vaccine given on day 0, 7, 21 or 28 followed by booster at one year and then a booster every three years.

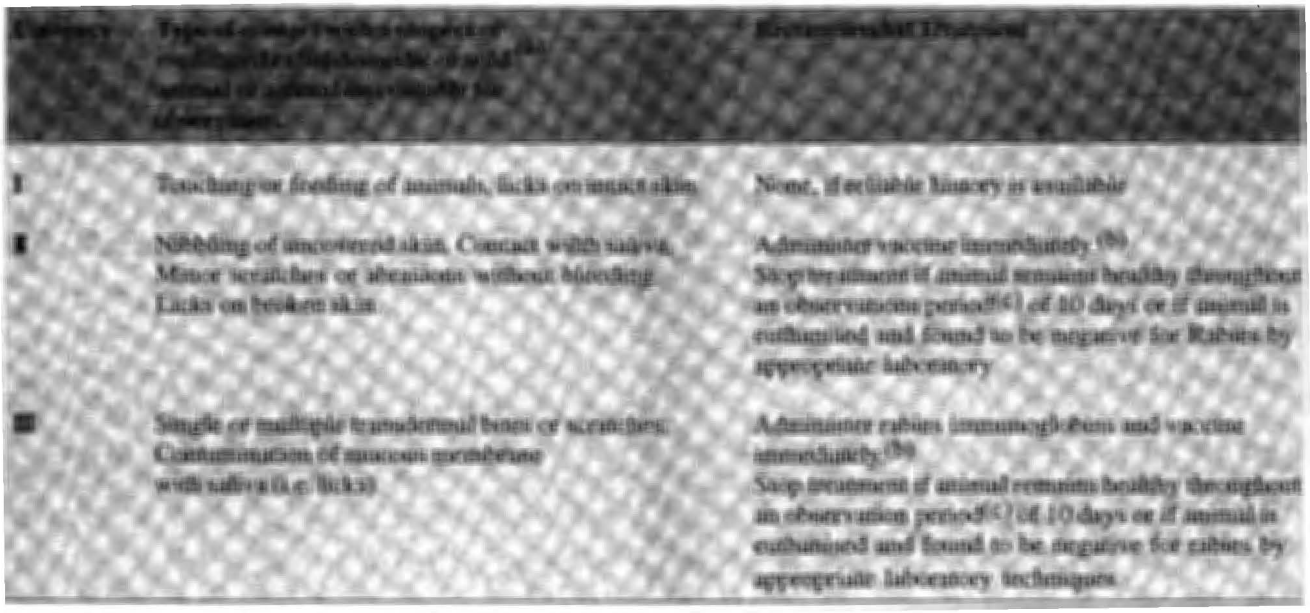
POST-EXPOSURE TREATMENT (PET)

Because of long incubation period, which is typical of most cases of human rabies, it is possible to institute prophylactic post exposure treatment. This must be started at the earliest to ensure that the individual will be protected before the rabies virus reaches the central nervous system. The WHO has recommended classification of animal bite for post-exposure treatment (Table 15.1). The Post Exposure Treatment (PET) is a three pronged approach:

- Management of wound,
- Passive Immunization,
- Active Immunization.

Management of wound: It is necessary to perform wound toilet even if the patient report late because it is imperative to remove as much saliva, and thereby the virus, from the wound as is possible. This can be done by prompt and gentle thorough washing with soap or detergent and flushing the wound with running water for 10 minutes. The application of soil, chilly paste, oil, etc. is common (Khokhar 2003) but unnecessary and damaging the tissue further. Suturing of wound should be avoided as far as possible. If unavoidable, minimum

Table 15.1: WHO guidelines for Post-Exposure Treatment (PET)



a. Exposure to rodents, rabbits and hares seldom, if ever, requires specific anti-rabies treatment
b. If an apparently healthy dog or cat in or from a low risk area is placed under observation, the situation may warrant delaying initiation of treatment.
c. This observation period applies only to dogs and cats. Except in the case of threatened or endangered species, other domestic and wild animals suspected are rabid should be killed humanely and their tissues examined using appropriate laboratory techniques.

loose sutures should be applied after adequate local treatment along with proper infiltration of antirabies serum. Cauterization of wound is no longer recommended as it leaves a very bad scar, and does not confer any additional advantage over washing the wound with water and soap. Injection TT should be given to the unimmunized individual. To prevent sepsis in the wound, a suitable course of an antibiotic may be recommended. After thorough washing any one of the available antiseptic solution (Savlon, Dettol, povidone iodine, alcohol, etc) may be applied.

Passive Immunization: Antirabies serum (ARS) / equine rabies immunoglobulin (ERIG) has the property of binding with the rabies virus, thereby resulting in the loss of infectivity of the virus. The dose is 40 IU per kg body weight of patient and is given after testing of sensitivity, up to a maximum of 3000 IU. Human Rabies Immunoglobulins are free of side effects and safer to use without sensitivity testing. Its doses are 20 IU per kg body weight, up to maximum of 1500 IU. In category III bites rabies immunoglobulins should be infiltrated in the depth and around the wound to inactivate the locally present virus. The total recommended dose of immunoglobulin must not be exceeded as it may reduce the efficacy of the vaccine. If the calculated dose of immunoglobulin is insufficient to cover infiltration in all wound, sterile saline can be used to dilute 2 or 3 fold to permit thorough infiltration. If immunoglobulin was not administered when vaccination was begun, it can be administered up to seventh day after the administration of the first dose of vaccine. Beyond the seventh day, Rabies Immunoglobulin (RIG) is not indicated since an antibody response to antirabies vaccine is presumed to have occurred. **Immunoglobulin should never be administered in a same syringe or at the same anatomical site as vaccine.**

Active Vaccination: WHO guidelines for post exposure treatment against rabies are given in table 15.1. The currently available antirabies vaccines in India can be grouped into various categories on the basis of the substrate used to grow the vaccine virus strain (Table 15.2). Pregnancy and lactation are no contraindication for rabies vaccination. In circumstances where no immunoglobulins are available greater emphasis should be given to proper wound toileting followed by Essen schedule of Tissue Culture Vaccine (TCV) with double doses on day 0 at 2 different sites intramuscularly (0 day-2 doses, one each on left and right deltoid, 3, 7, 14 and 28 days). Cell culture vaccine is costly but government of India provides this vaccine free of cost to those people who are below poverty live.

Table 15.2. Currently available antirabies vaccines in India

Name of the vaccine	Substrate
1. Neural tissue vaccine	Sheep brain*
2. Cell culture vaccine (Tissue culture vaccine)	
i) Human Diploid cell	MRC – 5
ii) Purified Chick Embryo cell vaccine	Primary SPF Chick embryo cells
iii) Purified Vero Cell Rabies vaccine	Vero Cells

* Withdrawn from India

Vaccination and Period of observation of animal

Risk of rabies from animal is reduced if dog is healthy and there is confirmed history of vaccination with minimum of two immunizations with potent rabies vaccine in last two years. The PET may be discontinued if animal involved (dog or cat) remain healthy throughout an observation period of 10 days. The observation period is valid for dogs and cats only. Bite of all wild animals should be treated as category III exposure. It should be noted that bites by rats, mice, squirrel, hare and rabbits seldom require treatment.

Post-Exposure Treatment (PET) for previously vaccinated person

Managing Re-exposure following post exposure treatment with Neural Tissue Vaccine (NTV): exposure after 6 months of completion of a course of antirabies vaccination with NTV should be considered as a fresh case. If within 6 months, a patient of Category I has been exposed to a category II or Category III wound, a full course of that type of exposure is indicated. However, if the patient has been treated earlier for a category II or category III exposure and the next exposure is also of same class, only two boosters of 5 ml each of ARV should be given one immediately on reporting and the second after a week.

Managing re-exposure following post-exposure treatment with Tissue Culture Vaccine (TCV): If re-exposed, person who has previously received full PET with a potent cell culture vaccine should be given only two booster doses, intramuscularly on day 0 and 3, but not RIG.

Managing exposure following pre-exposure prophylaxis with TCV: If a vaccinated person is exposed to rabies, a proper wound toileting should be done and two IM doses of TCV are given on day 0 and 3. Treatment with RIG is not necessary.

Intradermal Rabies Vaccination

Currently the modern rabies (Human Diploid Cell Vaccine, Duck Embryo Vaccine) vaccines are used by the intramuscular route but one dose of modern rabies vaccine costs about Rs. 250-300/- and a full course of 3 or 5 doses cost Rs. 900/- to Rs. 1500/- which is beyond the reach of common man. The majority of animal bite victims is from the poor and low- income group and is compelled to visit the government hospitals where multiple painful injections of Neural Tissue Vaccine (NTV) in abdomen wall are given. The cost of DEV/HDC vaccine can be reduced if it is given intradermally (ID) because dose in ID will reduced to one fifth of intramuscular dose. This is an alternative method for rabies vaccines which can be provided at the public health centers. Intradermal injections require very less dose and produce same results as intramuscular injection. The Drug Controller General of India (DCGI) has currently approves the Rabipur, Verorab, Abhayrab, and Pasteur Institute of India Vaccine. The approved schedule of intradermal injections includes sites on body 2-2-2-0-2 on zero, 3, 7, and 28 day in the dose of 0.1 ml administered ID over both left and right deltoid on day 0, both deltoid regions on day 3 and over both deltoid regions on days 7 and missing on 14 days and final on 28 days two doses in deltoid (Sudarshan 2006).

Another regimen tested is 4-0-2-0-1-1 on 180 healthy volunteers who were randomized to receive 0.1 mL volumes of PCECV or PVRV administered ID over both left and right shoulders and both deltoid regions on day 0, both deltoid regions on day 7 and over one deltoid region on days 30 and 90. a new four-site ID PEP regimen is a cost-effective and convenient alternative to IM (Essen or Zagreb) or ID (TRC or eight-site) regimens, especially using a 1 mL vial of vaccine (PCECV) (Ambrozaitis 2006). Adverse side effects of the vaccine are mild in anture like redness, swelling, itching, and pain at the site of injection. Compliance of the injection schedule is adversely associated with older age group, illiteracy, and center is located far from home. Reasons for delay or missing the dose are: holiday being scheduled on the day of ARV dose, personal or official workload, patients' forgetfullness about the scheduled date of vaccination and their migration outside the city and economical constraints. Patients' unawareness about ARV services available is another major reason for delay in taking the scheduled dosage among patients (Bariya B, et al 2013).

RABIES CONTROL UNITS

Agriculture Ministry of India had launched on share basis a Canine Control Program during 6th Five Year Plan under which rabies control activities are being perused through 30 rabies control units in different parts of country. In Union Territory such units were cent percent centrally sponsored. Senior Officer of the Animal Husbandry Department was overall in-charge of control activities in states. Each unit is headed by veterinary surgeon with supporting staff consists of one supervisor and 10 dog catchers. Each unit is provided with a diesel van, a cold storage system for vaccines, and equipment for catching stray dogs. The dogs are immunized against rabies and sterilized so that they don't reproduce. The dogs are not killed mercilessly after 1992 when the Prevention of Cruelty Against Animal Act was implemented. Only rabid and seriously ill and debilitated dogs are killed by painless methods.

The existing rabies control activities are carried out by Municipal Corporations/Committees, Cantonments, etc. in their respective areas. The Municipal administrators are being asked to enforce through legislative measures such as compulsory licensing and vaccination of all pet dogs, vaccination and sterilization of stray dogs within his/her area.

PROPOSED PILOT PROJECT

Objectives

- Elimination of Rabies

Target

- Reduction of rabies deaths in human beings by 20%

by the end of 10th Five Year Plan; 50% by the end of 11th Five Year Plan; 75% by the 12th Five Year Plan; and 100% by the end of 13th Five Year Plan.

Strategy

1. Prevent human deaths due to rabies by strengthening post exposure treatment; and
2. Establishing a collaborating mechanism with the ministry of agriculture for reducing canine rabies.

Components

1. Effective Coordination: The Ministries of Health and Agriculture are required to establish formal intersectoral coordination mechanism involving voluntary sector, municipal bodies, and local self government bodies.
2. Post-Exposure Treatment: with recommended vaccines and immunoglobulins, e.g., equine rabies immunoglobulins (ERIG), human rabies immunoglobulins (HRIG), and tissues culture antirabies vaccine.
3. Enhancement of Indigenous production of tissue culture vaccine by the government & private sectors.
4. Health Education: to the community and professionals is required to avoid any gap in knowledge and action.
5. Prophylaxis of people engaged in rabies work: both in the fields and in laboratories are needed.
6. Augmenting laboratory services: for the diagnosis and epidemiological work is also needed.

Priority Research Areas

1. Demographic data regarding dog population;
2. Mapping out incidence of rabies in animals;
3. Applied epidemiological features of rabies transmission;
4. Monitoring of vaccination program in dogs; and
5. Studies on efficacy and feasibility of intradermal routes of immunization in humans to phase out nervous tissue vaccine.

The NCDC acts as nodal agency for pilot project on prevention and control of rabies. More and more centers are adopting Indradermal route of vaccination. WHO collaboration center for References and Research in Rabies has been located in NIMHANS, Bangalore.

Control in Animals

India has a dog population of 25-35 millions and are estimated dog man ratio of 1:35. Majority are stray dogs. In 1998, the stray dog population was controlled by impounding and euthanizing technique which was against the animal rights. Therefore policy of Animal Birth Control (ABC) was adopted where stray dogs are sterilized and released in the same area. But such program need to be done in a large scale within 6 month period so that next dog reproductive cycle can be covered. Vaccination of dogs is also important to all pet animals. There is need of mass awareness about the prevention of rabies (Acharya et al 2012).

COMMENTS

Health Planners are still skeptical about the burden of dog bites and suffering it causes to people. There is no political will and no budgetary allocation for this problem at the national level. Legislation provides guidelines for proper maintenance of dog by the owner but due to lack of proper implementation these are always overlooked. In 10th Five Year Plan onward, rabies remains a public health problem in papers but nothing concrete came out. Once again control of rabies is a priority for the Indian government, according to its 12th five year plan (2012-17), but the population remains vulnerable because of shortages of anti-rabies vaccine, and once symptoms appear, dog rabies virus is universally fatal in humans.

Since the young children are more prone they should be targeted for any health education intervention. Infants and young children should never be left unsupervised around any dog no matter how friendly the dog may appear (Layer 1982). IEC includes information such as wash pet dishes separately from your own and rinse with boiling water. Children should never kiss animals and certainly shouldn't share dishes with them. Any turtle tanks, fish bowls, or bird cages should be placed out of reach. Parents and teachers need to be sensitized about the risk, etiology, removed of misconceptions and proper management of dog/animal bites. The general public should be made aware of vaccination programs, timely post-exposure prophylactic treatment, and avoidance of traditional, non-scientific, harmful treatment methods such as rubbing chilli powder in wounds, incantations and taking ineffective herbal medicines.

Intradermal vaccine is as effective as intramuscular but all commercial brands available in the market are not registered for intradermal in India whereas same vaccines are used in other countries. Presently dose is available in 1 ml ampoule and can not be used or more 5 patients are available at health center, so it is essential for companies to change the size of ampoule. The I/D route requires only 0.2 ml at a time.

In contrast to the West, where other mammals such as bats and racoons are implicated in transmission, stray dogs comprise the predominant reservoir for the rabies virus in the developing world. In Mumbai, 82 247 cases of dog bites were reported in 2012. Someone is bitten by a dog every two seconds in India and someone dies from rabies every 30 minutes on an average. And because rabies is not a notifiable disease in India the actual burden is likely to be even greater. This makes rabies an endemic public health nuisance to visitors as well as the local population, and the disease is spreading to neighbouring countries where it is not yet endemic (Chatterjee & Riaz 2013). Estimates of dog bites and rabies cases show large discrepancies in published studies. For example, a national multi-centred survey found an incidence of two per 100 000 population per year. But another national multi-centre study sponsored by WHO found an annual incidence of 1700 per 100 000 population. The discrepancy is likely a result of different case definitions used in different studies as well as poor reporting. Reliable national data on which to base policy can be obtained only by making rabies a notifiable disease. Some experts think that legislation is necessary to make rabies a notifiable disease but others think a sound surveillance system, especially in rural India, must precede legislation.

A disease that is 100% fatal and also 100% preventable should be taken with utmost seriousness, but rabies remains a neglected disease at all levels. There is disconnect between research on rabies and policy, and that making and implementing evidence based policy is difficult. India should revise its recommendations on treatment. In India, at least 12 700 people die of rabies encephalitis a year, indicating failure to provide adequate post-exposure prophylaxis. Although the government provides free vaccine in many hospitals, some patients fail to seek treatment. For others the vaccine and rabies immunoglobulin are unaffordable or supplies are limited by the budget of small health centers. Reduction in the cost of treatment is needed most importantly in rural areas where 90% of the deaths occur. Pre-exposure prophylaxis is not government policy but should be a priority in endemic regions and among vulnerable groups such as dog handlers, veterinarians, doctors, and nurses (Chatterjee & Riaz 2013).

Dog control: The current approach in India is piecemeal implementations of specific prevention and control strategies, mainly targeting the human component of rabies. But canine rabies can be eliminated with dog sterilisation and mass vaccination. India has an estimated one dog for every 36 people, and only an estimated 20% are pets. The incidence of rabies transmission increases with this ratio, however, the relation is complex, and culling stray dogs is ineffective. To be successful, programs must sterilise 70% of stray dogs in a particular area within six months before the next reproductive cycle begins but sterilising all stray dogs is not the best solution. If someone wants to have dog or domestic animal, it's his or her responsibility to get them immunised.

Animal welfare standards: Thailand and Sri Lanka have reduced the rabies burden by building partnerships between human and veterinary medicine. India lacks the political commitment to act on canine rabies. However, in recent years the Indian union ministries of health and agriculture and state animal husbandry departments are working with non-government organizations. There is lack of nationally representative surveillance of rabies in India.

Strengthening diagnostic facilities: A definitive rabies diagnosis in animals is determined by a postmortem examination laboratory test. More than 80% of veterinary labs in India still use the out dated Negri body method for diagnosis of rabies in animals, and the fluorescent antibody technique is used in fewer than a dozen laboratories because it is more expensive.

Sikkim is about to be certified as the first rabies-free state in India. This can be appreciated to an innovative state-wide campaign to vaccinate dogs. This was carried out by Vets Beyond Borders, an Australian non-profit organisation, with the support of the Sikkim government and the National Centre for Disease Control. Sikkim is planning to strengthen dog

registration rules, introduce microchipping of pets, control of dog border movements to prevent the unintentional importation of infected animals, and establish an ongoing sero-surveillance program (Chatterjee & Riaz 2013).

Canine vaccination is the suggested strategy of choice towards elimination of rabies (WHO but this may not be cost effective in India because the cost of a ca-nine vaccination programme is three to 10 times higher than the cost of human prophylaxis (Abbas 2014). Even at a cost of 0.13 US dollars (US$) per vaccinated dog, the total cost per year for a national programme of canine vaccination would be US$ 23 million – 27% of the total budget of the State Department of Animal Husbandry in 2012.

Therefore it is pertinent to develop strategy involving animal welfare, human medicine, vetenary medicine, civil administration, civil societies.

References

Abbas SS, Kakkar M, Rogawski ET; Roadmap to Combat Zoonoses in India (RCZI) initiative. Costs analysis of a population level rabies control programme in Tamil Nadu, India. PLoS Negl Trop Dis. 2014 Feb;8(2):e2721. doi: http://dx.doi.org/10.1371/journal.pntd.0002721 PMID: 24587471.

Acharya A, Kaur R, Kulwant L. Rabies epidemiology and control in India: A review. Journal of Com Dis 2012; 44(2): 59-69.

Ambrozaitis A et al. Vaccine. 2006 May 8;24(19):4116-21. Epub 2006 Feb 28.

Bariya B, Shringarpure KS, Patel SV, et al. Compliance of animal bite patients managed by intradermal route of anti-rabies vaccination, RR: Journal of Immunology 2013.

Chatterjee S, Riaz H. Rabies: beware of the dog. (Feature: Zoonotic) *BMJ* 2013;347:f5912 doi: 10.1136/bmj.f5912

Govt. of India. Rabies current status and proposed control Program in India. NICD-DGHS 1985.

Govt. of India. Report of the Working group on communicable diseases for the tenth five year plan. Planning Commission, Govt. of India, August 2001.

Govt.of India. Zoonotic Diseases of Public Health Importance. NICD DGHS 2000.

Hampson K, Coudeville L, Lembo T, Sambo M, Kieffer A, et al. Estimating the Global Burden of Endemic Canine Rabies. PLoS Negl Trop Dis 2015: 9(5): e0003786.

Kale KM, Wadhva SK, Aswan NR, Vasudeo. Dog bites in children. Inj J Com Med 2006; 31 (1): 24-25.

Khokhar A, Meena GS, Mehra M. Profile of dog bite cases attending MCD dispensary at Alipur, Delhi. Ind J Com Med 2003; 28 (4): 157-160.

Lauer EV, White WC, Lauer BA. Dog bites: a neglected problem in accident prevention. AJDC 1982; 136: 202-04.

NICD. Guidelines for management of animal bites. CD Alert of National Institute of Communicable Diseases Ministry of Health Government of India 2002; 6(3)1-8.

Sandhu TS. Rabies: What we know and what we need to know. Ind J Com Med 2004; 29(4): 163.

Sekhon AS, Singh A, Kaur P, Gupta S. Misconception and myths in the management of animal bite cases. Ind J Com Med 2002; 27 (1): 9-11.

Singh US, Choudhary SK. Ind J Com Med 2005; 30 (3) 81-83.

Sudarshan MK. Assessing Burden of rabies in India: WHO sponsored national multicentric rabies survey, 2003. Ind J Com Med 2005; 30 (3): 100-101.

Sudarshan MK et al. An epidemiological study of animal bites in India: results of a WHO sponsored National Multicentric Rabies Survey 2006; 38 (1): 32-39.

Sudarshan MK. Ind J Public Health 2006; 50 (4): 208-212.

WHO. Guidelines for post-exposure treatment on 8th Report of the WHO expert committee on Rabies, WHO Technical Report Series 824, 1992.

WHO expert consultation on rabies. Second report [Technical Report Series 982]. Geneva: World Health Organization; 2013.

CHAPTER 16

INTEGRATED DISEASE SURVEILLANCE PROGRAM (IDSP)

INTRODUCTION

The disease burden of the people of India is one of the highest in the world. This is mainly due to the heavy burden of infectious diseases. We have a *triple burden* of infectious diseases. Firstly, we have those infectious diseases that are prevalent worldwide and for which specific preventive measures are yet not available. Secondly, we have infectious diseases that are prevalent because of insufficient public health measures. In industrialized nations such disease were once rampant, but they have been controlled with the efficient application of the principles of public health. Thirdly, diseases perpetuated by the prevalence of vectors as well as vertebrate fauna, and the ecological determinants which are specific to our geo-climatic features.

Diseases due to infections or specific toxins are more easily preventable since a single extraneous agent causes them, even though their transmission may be complex. Noninfectious diseases tend to be multifactorial and are therefore, less easily amenable to control measures. It can be concluded logically, that the control of infectious diseases are of immediate high priority because they are more common and are preventable diseases. But planing for disease prevention and control depends upon the disease frequency, distribution and determinants that can be made available through proper surveillance.

Surveillance

Survey: An investigation in which information is systematically collected but in which the experimental method is not used. A population survey may be conducted by face-to-face inquiry, by self-completed questionnaires, by telephone, postal service, or in some other way. Each method has its advantages and disadvantages. The generalizability of results depends upon the extent to which the surveyed population is a representative.

Surveillance: It is the continuous scrutiny of all aspects of occurrence and spread of disease that are pertinent to effective control. It is systematic collection of pertinent morbidity and mortality data, the orderly consolidation of these data, special field investigation and rapid dissemination of this information to those responsible for control or prevention and then the control measures are evaluated for its effectiveness.

Sero-surveillance: Identifies patterns of current and past infection and based on blood or sera.

Sentinel surveillance: is a specialized surveillance in which trends in disease are monitored over a period of time and analyzed by groups and places. It includes strict sampling procedures in limited sites with specific population groups. These specific groups are high risk groups- STD clinic attenders and injecting drug users. Examples of High risk groups include all pregnant

women from antenatal clinics as representatives of general population. The trends of HIV infection will be monitored among these groups over time with one round of sentinel surveillance every year. This will generate reliable information on dates and trends of infection. This helps government and non-government program managers at state and local levels to plan effective program and service delivery. This information is also extremely important in the advocacy process with key local, state and national policy and decision makers.

A systematic process of reporting of various diseases of public health importance, as and when, and where, they occur, to a designated agency responsible for taking effective interventional steps, is known as ***disease surveillance***. Its success will depend upon 3R, i.e., the quality of diagnosis (Recognition), the timeliness and completeness of Reporting, and analysis and effective feedback Response.

Infectious diseases occur as a result of amplification and transmission of infectious agents. Detecting disease, as, when and where it occurs, and it's clustering, are essential for disease control. Surveillance, in other words, is the first step in intervention. In the absence of surveillance, disease may spread unrecognized. By the time the outbreak is recognized, the best opportunity to take intervention measures might have been over.

Surveillance is essential for the early detection of emerging (new) or reemerging (resurgent) infectious diseases. In the absence of surveillance, individual health care workers may not recognize the new disease, but may apply a near-fit diagnosis of a locally prevalent disease, which the disease in question may resemble.

The eradication of poliomyelitis requires systematic surveillance of acute flaccid paralysis in every part of the country. Measles will be targeted for eradication in near future; once again surveillance for measles will therefore become imperative. Instead of establishing single-disease surveillance one at a time, the opportunity must be seized to develop comprehensive disease surveillance for effective disease control.

Surveillance has been identified as backbone of any health care delivery system. It is expected to provide an essential data to monitor progress of on going disease control programs and help in optimizing the allocation of resources. It will be able to detect early warning signals of impending outbreaks and will help initiate an effective response in a timely manner. Surveillance also facilitates the study of disease patterns in the country and identify new emerging diseases. It plays a crucial role in obtaining political and public support for the health programs in the country. Surveillance can be effectively utilized for the purpose of social mobilization to help the public participate actively in controlling important diseases and reducing the disease burden.

The frequency of the occurrence of epidemics is an indication of the inadequacy of the surveillance system and preparedness to identify and control outbreaks in a timely manner. Keeping these facts about surveillance in mind, various programs have started collecting relevant data about the disease frequency and trends in the population and using it for disease prevention and control. Such surveillance has benefited their respective programs. Based on these findings the government has advocated to improve disease surveillance through following bodies of the government:

- Central Council of Health and Family Welfare
- Technical Advisory Committee on Plague
- Committee on National Mission on Environmental Health and Sanitation
- Expert Committee on Revamping of Public Health System
- National Apical Advisory Committee for National Disease Surveillance and Response System disease
- Technical Advisory Group on Disease of International Public Health Importance
- Program for Surveillance of Communicable Diseases
- Existing components for Disease Surveillance in Disease Control Programs
  - The National Vector Borne Diseases Control Program
  - National Leprosy Elimination Program
  - Revised National TB Control Program
  - Nutritional Surveillance
  - National AIDS Control Program
  - National Polio Surveillance Program as a part of Polio Eradication Initiative
  - National Program for Control of Blindness (Sentinel Surveillance)

- ICDS also monitor the nutritional status of children and other beneficiaries

Data is collected and separately utilized by the program managers but it is never comprehensively managed at the national level. At the same time huge resources are used in such exercises and there is lot of duplication. To remove various limitations and costs a comprehensive and integrated disease surveillance is always in need. Recognizing the importance of surveillance, the government of India has initiated the planning on Integrated Disease Surveillance Project from 1998 by engaging World Bank, WHO, CDC, National Institute of Health, USAID, DFID, NICD, ICMR, and others.

National Health Policy 2002 envisaged a well functioning system of surveillance by 2005. The Ministry of Health and Family Welfare launched the Integrated Disease Surveillance Project in 2004 with the aim to detect early warning signals of impending outbreaks that would help to initiate an effective response in a timely manner. Total budget from 2004-09 was Rs. 428.36 crores. External funding is stopped and now the IDSP continues during 12th Plan under NRHM with outlay of Rs. 640 Crore from domestic budget only.

Major Objectives

- To establish a decentralized state based system of surveillance for communicable and noncommunicable diseases, so that timely and effective public health actions can be initiated in response to health challenges in the country at the state and national level.
- To improve the efficiency of the existing surveillance activities of disease control programs and facilitate sharing of relevant information with the health administration, community and other stakeholders so as to detect disease trends over time and evaluate control strategies.

Specific Objectives

- To integrate, coordinate and decentralize surveillance activities,
- To surveil a limited number of health conditions and risk factors,
- To establish systems for quality data collection, reporting, analysis and feedback using Information Technology,
- To improve laboratory support for disease surveillance,
- To develop human resources for disease surveillance,
- To involve all stakeholders including private sector and communities in surveillance.

Types of Surveillance

*1. **Syndromic Surveillance:*** Health workers in the field will do the surveillance on the basis of syndrome which they can identify.

*2. **Clinical Surveillance:*** This will be carried out by medical officers and based on his/her clinical skills, they will diagnose the case clinically and report.

*3. **Laboratory Surveillance:*** This is based on the laboratory diagnosis which is more confirmed about the disease pathology or etiology. For all practical purpose such diagnoses are not required for an epidemic response.

Phasing of IDSP covering the states of India

Phase I (Commencing from Financial Year 2004-2005): Andhra Pradesh, Himachal Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Uttaranchal, Tamil Nadu, Mizoram and Kerala.

Phase II (Commencing from Financial Year 2005-2006): Chhatisgarh, Goa, Gujarat, Rajasthan, West Bengal, Manipur, Meghalaya, Orissa, Tripura, Chandigarh, Puducherry, Delhi

Phase III (Commencing from Year 2006-2007): Uttar Pradesh, Bihar, Jammu & Kashmir, Jharkhand, Punjab, Arunachal Pradesh, Assam, Nagaland, Sikkim, Andoman & Nicobar, D & N Haveli, Daman & Diu, Lakshdweep.

Project Activities

1. Decentralizing and integrating Surveillance Mechanisms:

- Decentralizing and strengthening disease surveillance and response mechanisms, facilitating sharing of surveillance data for decision making at the state level.
- Establishing linkages with private health care delivery systems and medical colleges both in rural and urban areas and actively involving village populations and other stakeholders in the surveillance activity.

2. Upgradation of Laboratories

- Renovation and furnishing of laboratories
- Supply of Laboratory Equipments
- Laboratory Material and Supplies

3. Information Technology and Communication
- Computer Hardware and Office Equipment
- Software for surveillance
- Leasing of wide area networking

4. Human Resources and Development
- Consultant /Contract Staff
- Training
- Information Education and Communication

5. Operational Activities and Response

6. Monitoring and Evaluation

Diseases and Conditions covered under IDSP

The diseases to be included in the surveillance program will be based on the following criteria: (1) Burden of disease in the community, (2) Availability of public health response and 3) Special considerations and international commitments. Following conditions have been included under Integrated Disease Surveillance Project:

Category	*Disease and Condition*
Regular Surveillance	
Vector Borne Diseases	1. Malaria
Water Borne Diseases	2. Acute Diarrheal Disease (Cholera)
	3. Typhoid
Respiratory Diseases	4. Tuberculosis
Vaccine Preventable Diseases	5. Measles
Disease under Eradication	6. Polio
Other Conditions	7. Road Traffic Accidents
Other International Commitments	8. Plague, Yellow fever
Unusual Clinical Syndrome	9. Meningoencephalitis/ Respiratory Distress Hemorrhagic fevers, Jaundice, other undiagnosed conditions
Sentinel Surveillance	
Sexually transmitted Diseases/Blood Borne Diseases	10. HIV/HBV, HCV
Other Conditions	11. Water Quality
	12. Outdoor Air Quality (Large Urban Areas)
Regular Periodic Survey	
Non Communicable Risk Factors	13. Anthropometry, Physical activity, Blood Pressure, Tobacco, Nutrition, Blindness and any other unusual health conditions of emergency

Additional State Priorities

- Each state may identify up to five additional conditions for surveillance, e.g., Dengue, Japanese Encephalitis, Leptospirosis, etc.
- Government of India may include other diseases in a case of public health emergency or any other unusual health condition.

Administrative Structure

The chairman of the National Surveillance Committee is Secretary Health with members from various departments for better coordination (Figure 16.1).

Data Management

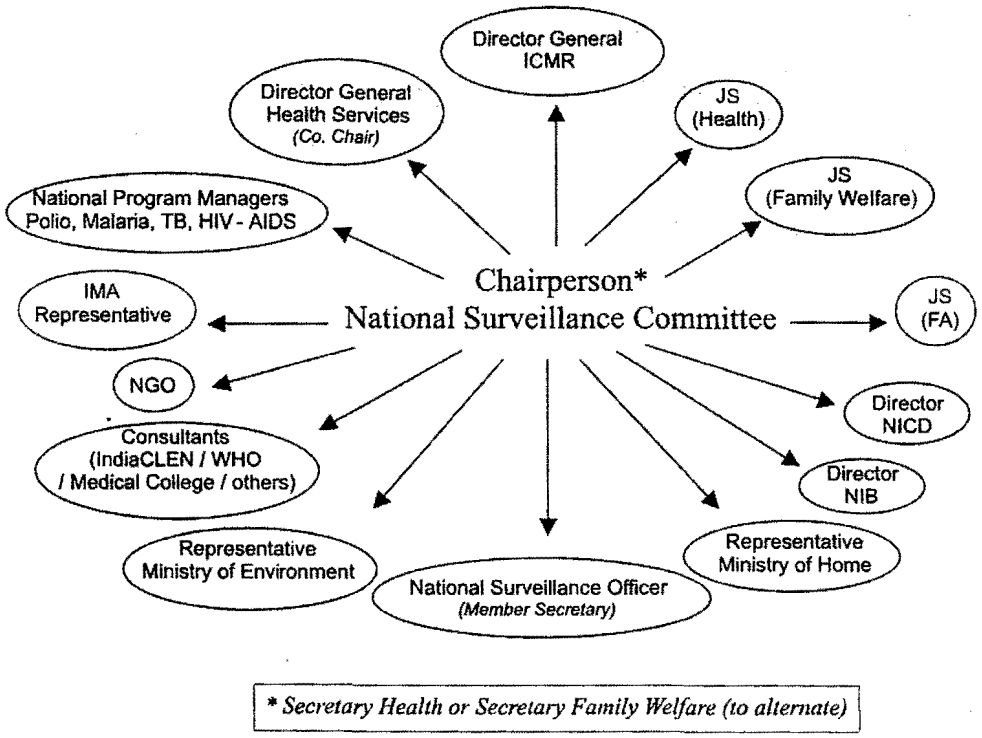
Under IDSP data is collected on a weekly basis (Monday-Sunday). The data is collected on 3 specified reporting formats, namely 'S', 'P' & 'L' filled by health worker, clinician and clinical laboratory staff respectively. The weekly data gives the time trends. Whenever a rising trend of illness in any area is noticed, it is investigated by the Medical Officer/Rapid Response Team to diagnose and control the outbreak. Data analysis is carried out by their respected units. Emphasis is laid on reporting of surveillance data from major hospitals both from private and public sector and also from infectious Disease Hospital.

The structural framework and information flow of the surveillance system in rural and urban area is depicted in figure 16.2.

Functions of National Surveillance Unit

- Execution of Approved Annual Plan of Action for IDSP.
- Monitor progress of implementation of the project.
- Obtain physical reports and expenditure statements from states.
- Seek reimbursement from the World Bank through Controller of Account.
- Report regularly to National Disease Surveillance Committee.
- Production and dissemination of prototype guidelines, manuals and modules.
- Implement central level activities: Procurement of goods, training and IEC.
- Analysis of data from the states and provide feedback on trends observed.
- Coordinate with NICD, ICMR and others.

Figure 16.1: Organogram National Surveillance Committee



- Organize surveys on noncommunicable diseases and risk factors.
- Conduct periodic review meetings with State Surveillance Officers.
- Organize independent evaluation of various activities.

State Level

Chairperson of the State Surveillance Committee is State Secretary Health. He is supported by Joint Director (State Surveillance Officer). There are 2 consultants (for Technical & Training and Finance & Procurement) and one data manager, two data entry operators, one office assistant and class IV employees.

Functions of State Surveillance Unit

- Collation and analysis of data received from district and transmitting to CSU.
- Coordinating activities of rapid response teams and deputing them to the field.
- Monitoring and reviewing the activities of the district surveillance units including checks on validity of data, responsiveness and functioning of the laboratories.
- Coordinating the activities of the state public health laboratories, medical colleges and other state level institutions.
- Sending regular feedback to the district units on the trend analysis of data.
- Coordinating all training activities under the project (Table 16.1).
- Organization of meetings of the state surveillance committee.

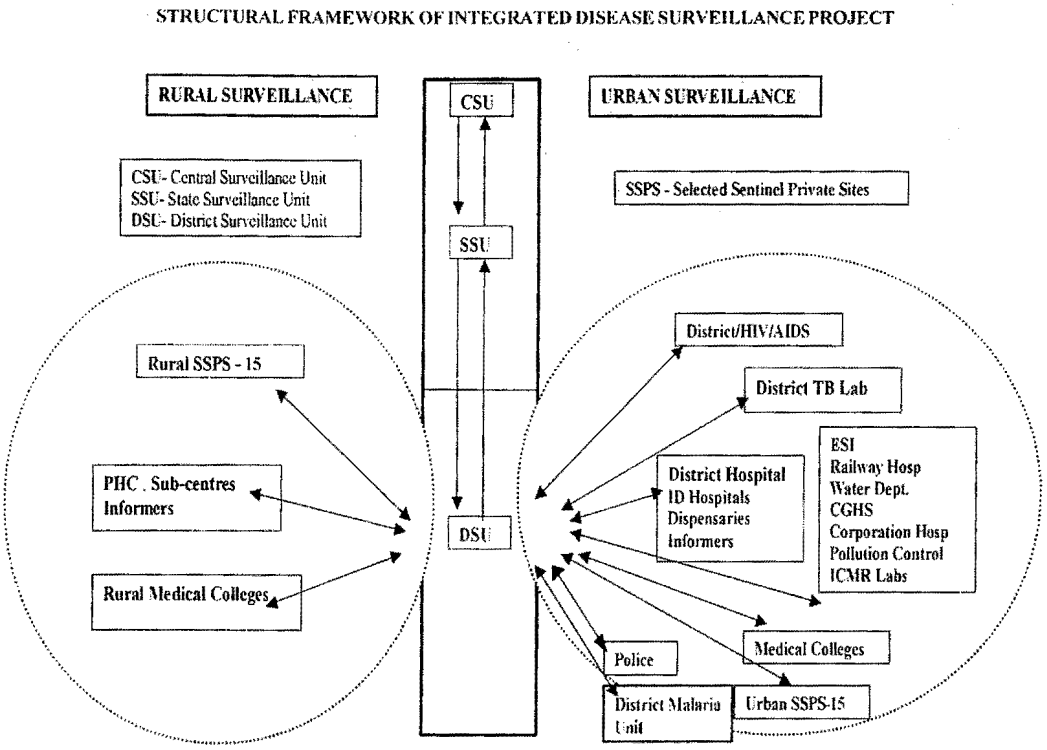
District Level

Chairperson District Surveillance Committee is District Collector or District Magistrate. Deputy Chief Medical Officer acting as DSO.

Functions of District Surveillance Unit

- Collation and analysis of data received from all reporting units and transmitting to SSU.
- Constituting rapid response teams and deputing them to the field whenever needed.
- Implementation and monitoring of all project activities.
- Coordinating activities of the public health laboratories, medical colleges, NGOs and Private Sector.

Figure 16.2: Structure framework of integrated disease surveillance project



- Sending regular feedback to the reporting units on the analysis of data.
- Organizing training and IEC activities within the district.
- Organizing meetings of the district surveillance committee.

Surveillance Components

There are three parallel systems of surveillance that will be established:

a) **Syndromic** - diagnosis made on the basis of symptoms by paramedical personnel and members of the community.

b) **Presumptive** - diagnosis made on typical history and clinical examination by medical officers.

c) **Confirmed** - clinical diagnosis confirmed by an appropriate laboratory tests.

Rural Area

Public Health Sector

- PHC s/ CHC s , Subdistrict & District Hospitals

Private Health Sector

- Sentinel Private Practitioners and
- Sentinel Hospitals

Urban Area

Public Health Sector

- Urban Hospitals, ESI, Railway, CGHS hospitals and dispensaries, other hospitals medical collages, Municipal Corp. Hospitals and dispensaries, etc.

Private Health Sector

- Sentinel Private nursing homes, Sentinel Hospitals, Medical Colleges, NGOs, Private laboratories

Involvement of Private Sector

- Strategic alliance through professional association (IMA, IAP).
- Selection by volume of target diseases, geographical coverage, credibility and willingness to participate.
- Providing linkages through web or transmission by e-mail, fax/ telephone/courier.
- Recognition and partnership.

Involvement of Medical Colleges

Each medical college will be integrated into this surveillance system. Their role in providing following services are acknowledged: reference laboratories, quality assurance, training, epidemic investigation, Non-Communicable Diseases Surveillance.

Surveillance Actions for Communicable Diseases

- Feedback and sharing information by the stakeholders such as medical officers of PHCs, CHC, District hospital, Sentinel private practitioners participating in IDSP, participating laboratories, and state and central level administration.
- Response to the surveillance information should be in the form of immediate release of guidelines, annual report, and integration of surveillance data generated in various disease control programs.
- Level of response is specified in the form of trigger; e.g. for *trigger–1* local response by health worker and medical officer; for *trigger–2* district level response by DSO and RRT; for *trigger–3* state level response to an established outbreak; for *trigger–4* national level response and *trigger–5* international level response to an established outbreak.

Warning signs of an Impending Outbreak

1. Clustering of cases or death in time and /or space,
2. Unusual increase in cases or deaths,
3. Even a single case of measles, AFP, Cholera, Plague, dengue or JE,
4. Acute febrile illness of unknown aetiology,
5. Occurrence of two or more epidemiologically linked cases of meningitis, measles,
6. Unusual isolate,
7. Shifting in age distribution of cases,
8. High vector density,
9. Natural disasters.

Epidemic [from the Greek *epi* (upon), *demos* (people)] is the occurrence in a community or region of cases of an illness, specific health - related behavior, or other health related events clearly in excess of normal expectancy.

Epidemic Response

Epidemiological response include following actions:

1. Definition of outbreak;
2. To confirm that an epidemic actually exists;
3. To assess the magnitude of problem in terms of morbidity and mortality and its geographical spread using working case definition;
4. To identify the source of infection and mode of transmission; and
5. To institute area and situation specific control measures.

Surveillance of Noncommunicable Diseases (NCD)

Aims of NCD risk factor surveillance

1) Monitor trends of important risk factors of NCD in the community over a period of time;
2) Evolve strategies for intervention of these risk factors so as to reduce the burden of diseases due to noncommunicable disease;
3) Strengthen NCD surveillance at District level; and
4) Integrate NCD risk factor surveillance with IDSP.

NCD Risk Factors

- **Behavioral**
  - Tobacco and Alcohol use
  - Dietary habits
- **Physical**
  - Levels of physical inactivity
- **Biochemical Assessments**
  - Blood sugar
  - Blood cholesterol
- **Measurements**
  - Height, weight, pulse rate, blood pressure, waist circumference

Many projects have been started at central and state levels. Overall supervision is given to ICMR for this component.

LABORATORY NETWORK

- Incremental infrastructure support,
- Equipments to perform the specific tasks where necessary,
- Additional reagents as required,
- Communication and networking,
- Training and human resource development to carry out high quality work.

INFORMATIONAL TECHNOLOGY NETWORKING AND LINKAGE WITH ISRO

IDSP visualized the need of establishing an integrated health information center at the district level supported by connectivity with adequate bandwidth that allows distance training and video conferencing in addition to data transfer. Accordingly, Indian Space Research Organization (ISRO) was requested to help in establishing the network for IDSP for distance education, data transmission, and video conferencing. This would require setting up of Satellite Interactive Terminals (SITs) at 800 sites across the country. ISRO has already installed a Hub at NICD and Nirman

Bhawan linked up with all states and District Surveillance Units, National & State level Medical and Health Institutions Reference Public Health Laboratories, and Medical Colleges. ISRO has also committed setting up of another 300 SITs. It is now learned that ISRO has assigned a bandwidth of only 8 MHs to this network. This bandwidth is not sufficient to operate all the function, especially the data transmission. Therefore, setting up of more SITs by ISRO has been put on hold for time being and NIC has been requested to put a detailed technical and financial proposal to establish a terrestrial network for IDSP and integrate it with the satellite network being provided by the ISRO.

TRAINING

Eight training institutes have been identified to conduct training of the District Surveillance teams. Orientation training has been imparted at National Institute of Health & Family Welfare, New Delhi and modules are being prepared. Due to an urgent need of disease surveillance following Tsunami disaster the training part is being diverted.

INFORMATION EDUCATION COMMUNICATION

1) Organization of sensitization Workshops;
2) Organization of review meetings of Surveillance Committee;
3) Publication of advertisement in local newspapers;
4) Printing: Manuals guidelines, training modules and prototype materials, leaflets, brochures, reporting formats etc.;
5) Production of TV spots and telecast through channels selected on the basis of viewers–ship ratings;
6) Radio: Production of Radio spots and broadcasting on channels based on audience ratings and reach; and
7) Indigenous methods (like street plays, Puppet shows, weekly bazaar, drum beating), counseling and motivation of public through interpersonal communication.

MONITORING AND EVALUATION

Key Performance Indicators

1. Number and percentage of districts providing monthly surveillance reports on time by state and overall;
2. Number and percentage of responses to disease-specific triggers on time-by state and overall;
3. Number of responses to disease- specific triggers assessed to be adequate-state and overall;
4. Number and percentage of laboratories providing adequate quality of information –by state and center;
5. Number of districts in which private providers are contributing to disease information;
6. Number of reports derived from private health care providers;
7. Number of reports derived from private laboratories;
8. Number and % of states in which surveillance information relating to various vertical disease control programs have been integrated;
9. Number and % of project districts and states publishing annual surveillance reports within 3 months of the end of the fiscal year; and
10. Publication by CSU of consolidated annual surveillance report (print, electronic including posting on the website) within three months of the end of fiscal year.

Evaluation Studies Under IDSP

Baseline Study: Existing quality of laboratory services and waste management practices.

Sample Surveys: Survey of risk factors of non – communicable diseases.

Mid- Term Evaluation: Evaluation of training activities at various levels; trends on laboratory quality assurance and waste management practices.

End-Line Evaluation: Evaluation of training activities at various levels; trends in laboratory quality assurance and waste management practices; effectiveness of information technology in surveillance cost –benefit analysis of the project

Incremental Operational Costs

- Travel costs, POL and maintenance of available Government vehicles used for surveillance activities. In case Government vehicles are not available, hiring of vehicles by direct contracting at prevailing Government/ market rates;
- Maintenance of equipment, computer hardware and accessories (after warranty period);
- Allowances to staff including per diem during tours;
- Expenditure on telephone, fax courier, electricity and other services;
- Office stationery and other consumable items;
- Other miscellaneous activities required for effective surveillance.

Achievements

IT network connecting 776 sites in States/District HQ and premier institutes has been established with the help of National Informatics Centre (NIC) and Indian Space Research Organization (ISRO) for data entry, training, video conferencing and outbreak discussion. A referral lab network has been established in 9 States (Gujarat, Punjab, Rajasthan, Uttarakhand, Karnataka, Tamil Nadu, Maharashtra, Andhra Pradesh and West Bengal), using the existing functional labs in the medical colleges and other major centers in the States and linking them with adjoining Districts for providing diagnostic services for epidemic prone diseases during outbreaks. Additional 23 identified medical college labs in Bihar, Assam, Odisha, Tripura, Kerala, Haryana, Jammu & Kashmir and Manipur were included in the laboratory network in 2012-13.

A total of 553 outbreaks were reported in 2008, 799 outbreaks in 2009, 990 outbreaks in 2010, 1675 outbreaks in 2011, 1584 outbreaks in 2012, 1964 outbreaks in 2013, 1562 in 2014 and 1935 have been reported in 2015. Majority of the reported outbreaks included those of Acute Diarrhoeal Diseases, Food Poisoning and Measles. The weekly outbreak report generated by the CSU is shared with all key stakeholders including the Prime Minister's Office.

COMMENTS

1. This program is very well needed for the prevention and disease control. It is well elaborated on data collection, analysis, feedback mechanism. Integration of communicable and non-communicable diseases is a real challenge for this program. Implementation of program is another issue. However, it is planned in a phased manner and experiment is already being carried out in National Surveillance Program for Communicable Diseases, so the government is hopeful for its success. Program needs professional epidemiologists to implement and should be placed appropriately.
2. The district level laboratories are not developed much. The district hospital must have adequate microbiology laboratory facilities, which will be available both for diagnostic purposes and for epidemiological investigations within the district. There is a need for a state level laboratory, for the purposes of supporting the laboratory service network in the districts, for establishing external quality assurance, for ensuring the availability of quality reagents and also for helping in investigating the etiology of disease of public health importance, endemic or epidemic. The State Epidemiology Center should, therefore have adequate laboratory facilities.
3. Number of parallel systems under various programs are still operational and duplication of record generation has not gone down.
4. Private sector and semi-government institutions have not been involved in the same proportion as of their numbers. Larger role of private sector in relation to information sharing is required. For this proactive and appropriate methods should be applied.
5. Many centers are not sending report and no training of professionals and staff involved in data collection and transmission has been completed. There are few examples of doing good and there are many who have not started at all. In some districts the data is transmitted through SMS which is much faster and timely.
6. Many diseases are emerging and threatening the public health which need to be included such as H1N1, diabetes screening, etc.

References

Bachani D. Integration of Disease Surveillance in India: Current Scenario and Future Perspective. Ind J Public Health 2006; 50 (1): 7-9.

Government of India. Integrated Disease Surveillance Project India: Project Implementation Plan 2004-2009. Ministry of Health & Family Welfare, Department of health, Nirman Bhawan, New Delhi.

Government of India. Annual Report 2005-2006. Ministry of Health & Family Welfare, Department of health, Nirman Bhawan, New Delhi 2006.

Indian Express. Isro Links 400 sites in disease prevention project. Indian Express Hyderabad 2006, Jan 24th.

Kishore J. A Dictionary of Public Health. 3rd edition. New Delhi: Century Publications 2013.

CHAPTER 17

NATIONAL PROGRAM FOR CONTROL & TREATMENT OF OCCUPATIONAL DISEASES

WORKFORCE

India is the second largest populated country in the world after China. The estimated global population was 6055 million (2000) and the population of India alone comprised of 1027 million (Census 2001). Of the 2.5 billion people at work worldwide, only 15% of the workforce lives in what may be termed as rich or high-income countries. The patterns of employment in these countries are quite different. In poor countries, 50-60% of the labor forces is into agriculture, with 29% in middle-income countries and 4% in the rich countries. It is quite evident that the low-income groups dominate the agricultural workforce.

Around 40 per cent of population belonged to the labour force – 41 per cent in rural areas and 37 per cent in urban areas. Labor force participation rate (LFPR) for males was nearly 56 per cent and it was 23 per cent for females. LFPR was about 55 per cent for rural males and about 56 per cent for urban males. It was about 25 per cent for rural females and about 16 per cent for urban females. Only 7.8% of the total employed people are working in 1999-2000 in the organized sector. This was about 7.93% in 1983. In the organized sector, majority are in the public sector (69.1%) and remaining in the private 30.9% (Datt 2002). Around 58% are in agriculture and fishery. There are 1.3 million workers engaged in manufacturing of basic chemicals, chemical products, petroleum, paper, leather and allied product. About 1.5 million workers are employed in cotton & textile printing industry; 5.4 million in construction work, 3.5 million in manufacturing industries, and many more in unorganized sectors. 22% of the workforce in India is employed in the service sector comprising community, social and personal activities, electricity, gas, water supply, transport, communication, wholesale and retail trade, financing, insurance and real estate. 14% of the workforce in India is employed in industries such as mining, quarrying, commerce, and manufacturing.

BURDEN OF OCCUPATIONAL DISEASE

Unsafe work conditions are rampant around the globe. If conditions are not improved for the hundreds of millions of people who work in unsafe, unhealthy environments, governments may face costly consequences. However, all occupational diseases are preventable.

120 million of occupational injuries with 200,000 fatalities per year; 68-157 million new cases of occupational and work related diseases caused by health hazards at work each year; total economic loss due to occupational illnesses amounts up to 10%-15% of GNP.

Occupational health factors have been implicated in over 10% of all admissions to general internal medicine wards in hospitals;

Occupational stress is being widely recognized among workers and, consequently, is beginning to add to the

total number of occupational disease cases receiving workers' compensation benefits. Heart disease, cerebrovascular accidents and other vascular diseases are common occupational illnesses.

Occupational Asthma: Over 200 agents in the workplace have shown to cause asthma and as now materials and processes introduces, more and more agents are being introduced in the list of stimuli. Work stress may also aggravate preexisting asthma. Around 6% of the people in general are suffering from Asthma. Work related asthma (including both occupational asthma and work aggravated asthma) has been estimated to be 15% of all asthma.

The World Development Report in 1993 estimated that a burden of 36 million Disability Adjusted Life Years (DALYs) loss, or 3 percent of the global burden of disease, is caused each year by preventable injuries and deaths in high-risk occupations and by chronic illness caused by exposure to toxic chemicals, noise, stress, and physically debilitating work patterns. The Report in 1996 has identified environmental pollution and occupational risks along with income, life-style, and the quality of life as the factors influencing a person's health.

In spite of this, tremendous negative impact on the health of working population has been observed. Only 5%-10% of workers in developing countries and 20%-50% of workers in industrialized countries (with a few exception) have access to occupational health services.

India

In India, the current burden of occupational health diseases is estimated to be at around 18 million cases. Among them the annual incidence of musculoskeletal disorder is 575,000, chronic respiratory diseases is 450,000 and dermatitis is 300,000. According to a survey conducted by The Indian Association of Occupational Health, among its members regarding their perception about occupational health problem the common hazards perceived were noise (92.3%), ergonomic (74.4%), chemical exposure (66.7%), mental stress (64%), dust related (61.5%), vibration (53.8%), heat stress (46.1%).

Injuries: Industrial growth characterized with massive production involving machines like cranes, conveyor system, lathes and other machine and tools which create numerous safety hazards. In major manufacturing activities such as iron and steel making, mining, construction, the work remains physically arduous and a variety of health and safety hazards are prevalent. 28 per cent of limb injuries coming to the hospital were due to occupational hazards. The victims were mostly young i.e. a mean age of 26 years. In Jute Mills, in a particular year, an accident rate of 177.94 workers for every thousand workers was observed. A total of 508,738 man-days were lost due to these accidents.

Pneumoconiosis: Prevalence of silicosis was 6.2-34% in mica miners, 4.1% in manganese miners, 30.4% in lead and zinc miners, 9.3% in deep and surface coal miners, 27.2% in iron foundry workers and 54.6% in slate-pencil workers. Prevalence of Asbestosis was extended from 3% in Asbestos miners to 21% in mill workers. In textile workers, the Byssinosis was as common as 28-47% (Kashyap et al. 1998). A report of Hindustan Times states that miners of iron ores and their family members were suffering from respiratory disorders and tuberculosis (HT 22nd March 2010).

Hypersensitivity Pneumonitis are common on exposure to moldy grain, compost, detergent, cheese, cork dust, sugar can fibers, moldy hay, bird dropping, paints, coatings.

Chemicals and metals: A large number of cases of adverse effects of exposure to heavy metals like Lead, Mercury, and Cadmium have been reported. Lead created hazards in Lead Storage Battery Manufacturing units, Printing works, and Engineering industry.

Inhalation fever: Exposure to organic dust, polymer fumes and metal fumes may give rise to flu like symptoms in workers. There could be symptoms, like chills, myalgia, headache, malaise, cough and chest discomfort.

Mining work is commonly associated with physical injuries and diseases.

Ultraviolet radiation exposure: Occupational safety and health problems due to 'argon-arc welding' have been

lately reported from engineering industry which has replaced traditional carbon dioxide welding. Newer type of welding generated more ultraviolet exposure leading to eye and skin problems among these welders. In one of the studies it was found that welders are at risk of eye, skin and muscuskeletal diroders (Chauhan A et al 2013).

Electromagnetic radiation: Home and office appliances emit radiation which is a new Phenomenon. More time would be required to establish cause and effect association through scientific studies.

Occupational Dermatoses: The most common among dermatoses is occupational contact dermatitis, which account for 95% of cases. Chemicals of plant origin are also responsible for contact dermatitis.

Musculoskeletal disorders among industrial workers in Delhi are common which is mainly due to manual work and heavy lifting of weights (Joshi 2001). In another study, (Saha TK et al 2010) in a garment industry musculoskeletal problems were the commonest health problems in workers (69.6%) and the most affected area is neck (64.1%) and lower back (41%). Musculoskeletal disorders are also common in dental professionals (Gupta N et al 2013).

Nutritional status in terms of body mass indices (BMI) of the workers is also significantly low (Kishore 2001).

Prevalence of stress among nurses (Bhatia et al 2010) and doctors was found high. Most recent the voilence against health professionals has increased many fold. There is no program to manage such stress among these professionals who themselves are responsible for health of people. Risk behavior among health workers is another area of concerned. Tobacco and alcohol among health workers is also very high (Jain 2011).

Unfortunately, very few nurses and doctors are trained to recognize or prevent occupationally induced illness. When doctors fail to ask patients about their work, work-related factors may be incorrectly attributed to non-occupational causes. There could be a wrong diagnosis leading to unnecessary tests during screening and for others are at risk to reach a correct diagnosis.

It was observed that an investment of $1 in the health promotion program in five years the benefit was $3-$5. In conclusion, there is a heavy burden of occupational diseases with a high impact on productivity, health and safety of India. It is imperative to strengthen occupational health in India through quality health services with more allocation of resources such as infrastructure, technology, and manpower development. India is signatory to many international treatises and ILO's conventions on occupational health.

According to WHO, 'Every citizen in the world has the right to a "healthy and safe work environment" and enable socially and environmentally productive lives'. National Health Policy, 2002 has also envisaged the periodic screening of the health conditions of the workers, particularly for high- risk health disorders associated with their occupation.

MAJOR OCCUPATIONAL ILLNESSES

National Institute of Occupational Safety & Health (NIOSH) has developed a priority list of 10 leading work-related illnesses and injuries. Three criteria were used to develop the list: a) the frequency of occurrence of the illness or injury, b) its severity in individual cases, and c) its potential for prevention. Occupational lung disease is first on the list. NIOSH considers occupational cancer to be the second leading work-related disease, followed by cardiovascular diseases, disorders of reproduction, neurotoxicity, noise induced hearing loss, dermatological conditions, and psychological disorders. Major occupational diseases can be divided in following categories for better understanding:

A. Occupational injuries
B. Occupational lung diseases
C. Occupational cancers
D. Occupational dermatoses
E. Occupational infections
F. Occupational toxic syndromes
G. Occupational mental disorders
H. Others, nonspecific

Occupational disorders can also be grouped according to the etiological factors:

1. Occupational injuries: ergonomic related
2. Chemical occupational factors: dust, gases, acid, alkali, metals etc.

3. Physical occupational factors: noise, heat, radiation. etc.
4. Biological occupational factors
5. Behavioral occupational factors
6. Social occupational factors

PROGRAM

Occupational health was one of the components of the National Health Policy, 1983 and now also included in National Health Policy, 2002 but very little attention has been paid to mitigate the effect of occupational diseases through proper program. Ministry of Health & Family Welfare, Govt. of India has launched a scheme entitled "National Program For Control & Treatment of Occupational Diseases" in 1998-99. The National Institute of Occupational Health, Ahmedabad (ICMR) has been identified as the nodal agency for the same.

Following research projects has been proposed to initiate by the Government:

1. Prevention, control and treatment of silicosis and silico-tuberculosis in Agate Industry.
2. Occupational health problems of tobacco harvesters and their prevention.
3. Hazardous process and chemicals, database generation, documentation, and information dissemination.
4. Capacity building to promote research, education, training at National Institute of Occupational Diseases.
5. Health risk assessment and development of intervention program in cottage industries with high risk of silicosis.
6. Prevention and Control of Occupational Health Hazards among salt workers in the remote desert areas of Gujarat and Western Rajasthan. Collaboration with Developed Nations in the Government of India and the United States have formed a collaborative effort to address outstanding issues in the fields of environmental and occupational health. The collaborating organizations have identified three broad areas for collaboration: emergency preparedness and response; training, education, and technology transfer; and research. Within the three broad areas, the organizations have identified two subject areas for initiation: arsenicosis and asbestosis. As many as 42 million people in West Bengal in India may be exposed to arsenic in drinking water at concentrations of health concern. Similarly, as many as 10 million industrial or mine workers in India may be exposed to asbestos or other dusts at concentrations of health concern (Allred et al 2003). Australia has collaborated for providing expertise in health and safety issues of biomedical wastes.

ELEVENTH FIVE YEAR PLAN

Objectives

1. To review the existing set up for Occupational Safety and Health in the work place and to suggest ways to improve it.
2. To examine the efficacy of the administrative machinery under the State Governments to ensure Occupational Safety and Health to the workers in factories and other nonagricultural establishments through the institution of "Factory Inspector", which exists under the Factories Act, and any other relevant Act (s).
3. To suggest the modalities for setting up of a National Board of Occupational Safety and Health to develop service providers or a band of professionals who are proficient in assessing the health and occupational safety at workplace.
4. To suggest such other measures which are necessary to ensure occupational health and safety of workers in (i) the agricultural occupations and (ii) nonagricultural occupations, in particular, workers in non-registered factories, road transport, shops, eating establishments, printing, dyeing chemical storage and handling etc.
5. To suggest ways to improve occupational safety and health practices in low income but high workers density occupation clusters.
6. To examine the efficacy of regulations concerning the health and safety implemented by Government Departments other than Labor' such as Explosive Act, Boiler Act, etc.

TWELVETH FIVE YEAR PLAN

1. Strengthening of Directorate General of Factory Advice Service & Labour Institutes (DGFASLI) Organisation and OSH in Factories.
2. Strengthening of Enforcement System in Ports and Docks
3. Development of Regional Labour Institute,

Faridabad as Centre of Excellence in Safety Systems in Micro small and medium enterprise (MSME) & Chemical Process Units
4. Effective Implementation of Occupational Safety, Health and Environment Systems at Work place in Manufacturing and Port Sector
5. Identification, Elimination and Control of Silicosis in India
6. Identification, Elimination and Control of Asbestosis in India
7. Strengthening of Enforcement Systems in Factories - Establishment of Industrial Safety, Occupational Health and Work Environment Centre in the State Factory Directorate - Centrally Sponsored Scheme

COMMENTS

Occupational Health has received the lowest priority in 11th Five Year Plan Document and National Rural Health Mission. The concept paper presented by ICMR on Health System Research has totally missed the occupational health and safety issues. Similarly, Ministry of Health & Family Welfare, Government of India has no special plan for occupational and health safety of workers which constitute a big proportion of total population. There are a number of legislations for workers but there is no formal program from the Government currently. It is assumed that occupational health problem is a problem of labor ministry. We know that the Law Department alone can not solve the health problem of workers and involvement of other sectors is a must, however, there is no initiative. Law implementaion should be associated with concerte solution of intervention. NIOH Ahmedabad run by ICMR is no presence at the national level. Similarly recently opened center of occupational & enviornmental health at National Center for Disease Control is hardly known to people. Lot of work on this issue need to be done on priority basis by government.

GLOBAL STRATEGY FOR OCCUPATIONAL HEALTH

The global strategy for achieving "occupational health for all" (WHO-SEARO 1999) includes the following ten major areas for action:

1. Strengthening of international and national policies for health at work and development of policy tools.
2. Developing healthy work environments.
3. Developing healthy work practices and promoting health at work.
4. Strengthening occupational health services.
5. Establishing support services for occupational health.
6. Developing occupational health standards based on scientific risk assessment.
7. Developing human resources for occupational health.
8. Establishing registration and data system including development of information services for experts, effective transmission of data, and raising public awareness through strengthened public information systems.
9. Strengthening research.
10. Developing collaboration in Occupational health services and organizations.

References

Allred M, Campolucci S, Falk H, Ganguly NK, Saiyed HN, Shah B. Bilateral environmental and occupational health program with India. Int J Hyg Environ Health. 2003 Aug; 206 (4-5):323-32.

Bhagoliwal TN. Economics of labor and industrial relations. Sahitya Bhawan, Agra 1995: 623-633.

Bhatia N, Kishore J, Anand T. Occupational Stress Amongst Nurses from Two Tertiary Care Hospitals in Delhi. Australasian Medical Journal AMJ 2010, 3, 11, 731-738.

Bureau of Labor Statistics. Labor Force Statistics derived from current Population Survey. Bulletin 2307 United States Department of Labor, Washington DC 1988: 567.

Chauhan A, Anand T, Kishore J, Ingle GK. Research and Reviews: A Journal of Medicine 2013 Special: 15-18.

Datt R. Economic Liberation and its implications for employment in India. In Mathur and Paikhy PS (ed). Economic Liberation and its implications for employment in India. New Delhi:Deep & Deep Publications, pp. 17.

Govt. of India. India 2005. Ministry of Information and Broadcasting, Publications Division 2005.

Govt of India. The Factories Act, 1948; Act No. 63 of 1948. New Delhi: Commercial Law Publishers (India) Pvt. Ltd.2002.

Govt. of India. Annual Report 2004-2005. Ministry of Health & Family Welfare. GOI, New Delhi.

Govt. of India. Annual Report 2000-2001. Ministry of Health & Family Welfare. GOI, New Delhi.http://planningcommission.nic.in/plans

Gupta N, Jain P, Kishore J. Musculoskeletal Pain among Dental Professionals. Research and Reviews: A Journal of Medicine 2013 (Special): 32-37.

Jain A, Kishore J, Sahoo J. Prevalence of Tobacco Use in Group C and D Employees in a Medical College of Delhi. Research and Reviews: A Journal of Health Professions 2011; 1 (2 - 3): 24-30.

Joshi TK, Menon KK, Kishore J. Musculoskeletal Disorders in Industrial Workers in Delhi. International Journal of Occupational & Environmental Health, Apr-June. 2001.

Kartikeyan S, Gurav RB. Gender Issues in Employment. Indian Journal of Occu & Environmental Medicine 2002; 6 (1):37-41.

Kashyap SK et al. Pneumoconiosis. Resp Med in the Tropics, Oxford University Press 1998.

Kishore J, et al. Health status of the male industrial workers of Delhi. Ind J Community Medicine 2001.

Leigh J, Macaskill P, Kuosma E and Mandryk J. Global Burden of Disease and injury due to occupational Factors. Epidemiology 1999; 10:626-631.

Malhotra R, Lal P, Prakash S, Daga MK, Kishore J. Profile of foodhandlers working in food services establishment located within the premises of a medical college in Delhi, India. Public Health 2007; 121:455-461.

Phoon WO. Practical Occupational Health. Singapore: PG Publishing 1988: 287-290 and 335.

Saha TK, et al. Health status of workers engaged in the small-scale garment industry: how healthy are they? Ind J Com Med 2010; 35 (1): 179-181.

Stell JM. The working environment of the working poor – Analysis based on workers compensation claims, census data and known risk factors. Women's Health 1987; 13(3/4): 83-101.

United States Public Health Services. Report of Task Force on Women's Health Issues. Public Health Reports 1988: 100 (1): 73-106.

Vallinmaki J. Ozne stalks where you least expect it. Work and Health Safety, Finnish Institute of Occupational Health, Hilsinki, Finland 1997: 30-31.

Women's Bureau. Twenty Facts on Women Workers. Fact Sheet No. 88-2. United States Department of Labor Washington DC 1988:1-2.

WHO-SEARO. Health Situation in the South-East Asia Region (1994-1997). WHO-SEARO, New Delhi 1999.

CHAPTER 18

NUTRITION PROGRAMS

INTRODUCTION

Measures of Malnutrition

Stunting is deficit in height-for age, wasting is deficit in weight for height and the underweight is deficit in weight- for-age in children. The three measures of nutrition are expressed in standard deviation unit (z-scores) from the median for the international reference population. Children who are more than two standard deviations below the reference median on any of the indices are considered to be *undernourished,* and children who fall more than three standard deviations below the reference median are considered to be severely *undernourished.*

Height – for –age (stunting) is a measure of linear growth retardation. Stunted or short children are those who are more than two standard deviations below the median of the reference population in terms of height –for-age. This indicator captures chronic undernutrition as it reflects a failure to receive adequate nutrition over a long period of time or from chronic or recurrent diarrhea. Height-for-age status therefore does not vary with the season in which data are collected. The second indicator, weight –for –height (or wasting) captures the thinness of children and indicates the prevalence of acute malnutrition. Wasting is typically the result of a failure to receive adequate nutrition in the period immediately preceding the investigation; and to that extent, results may capture seasonal variations in food supply or recent episodes of illness. The third indicator, weight-for-age (underweight) captures elements of both stunting and wasting that are indicators of chronic as well as acute undernutrition.

Burden of nutritoonal problems in the World

The recent estimates of Unicef, WHO and World Bank are as follows:

Stunting

- Globally, 162 million under-five year olds were stunted in 2012.
- The global trend in stunting prevalence and burden continues to decrease. Between 2000 and 2012 stunting prevalence declined from 33 percent to 25 percent and burden declined from 197 million to 162 million.
- In 2012, 56 percent of all stunted children lived in Asia and 36% in Africa.

Underweight

- Globally, 99 million under-five year olds were underweight in 2012.
- The global trend in underweight prevalence continues to decrease, but at a slow pace. Between 1990 and 2012 underweight prevalence decreased from 25 percent to 15 percent, which remains insufficient to meet the Millennium Development Goal of halving the 1990 prevalence by 2015.
- In 2012, 67 percent of all underweight children lived in Asia and 29% in Africa.

Wasting and severe Wasting

- Globally, 51 million under-five year olds were wasted and 17 million were severely wasted in 2012.

• Globally, wasting and severe wasting prevalence in 2012 were estimated at almost 8 percent and just less than 3 percent respectively.
• In 2012, approximately 71 percent of all severely wasted children lived in Asia and 28 percent in Africa, with similar figures for wasted children at 69 percent and 28 percent respectively.

Overweight

• Globally, 44 million under-five year olds were overweight in 2012.
• The global trend in overweight prevalence and burden is rising. Between 2000 and 2012 overweight prevalence increased from 5 percent to 7 percent and the global burden increased from 32 million to 44 million. The rise in overweight prevalence is reflected in all regions, while the burden is increasing in Africa, Asia and the developed countries, but stagnating in Latin America and Oceania.
• In 2012, overweight prevalence was highest in Southern Africa (18%), Central Asia (12%) and Southern America (7%).

Malnutrition has different levels of causation. It is strongly linked with poverty: poor children are more likely to be underweight at birth (Gillespie et al. 2003) and less likely to receive energy-rich complementary food (Brown et al 1998) and iodized salt (UNICEF 1998). At least they are more likely to be breastfed, and for longer, in poorer countries (Butz et al 1984), although HIV is now eroding this advantage. Poorer children live in environments that predispose them to illness and death (Esrey 1996), are less likely to live in household with safe water or sanitation (Huttly et al. 1997). They are more likely to be exposed to indoor air pollution from coal and biomass fuel such as wood or animal dung used for cooking and heating, coupled with inadequate ventilation (Bruce et al. 2000).

In 1994, 50% of US farm products came from 2% of the farms (Lehman and Krebs 1996). In the agrochemical sector ten companies control 81% of the US$ 29 billion global market. This dominance is increasing with the aggressive marketing of genetically modified seeds. The corporations have developed global brand names and global marketing strategies, albeit adapted to local tastes. They are defined by the global sourcing of their supplies; the centralization of strategic assess, resource and decision-making; and the maintenance of operations in several countries to serve a more unified global market.

Fewer and fewer households can subsist on herding, fishing or forestry. Every other hungry person is living in a farm household, on marginal lands where environmental degradation and exclusion threaten agricultural production. Poor fishermen are seeing their catches reduced by commercial fishing, and foresters are losing their rights as logging companies move in under government concessions. The average land holding per head among rural farmers in developing countries declined from 3.6 hectares in 1972 to 0.26 hectares in 1992- and continues to fall.

The average Indian family of four reduced consumption of foodgrains by 76 kg between 1998 and 2003(Patnaik 2004). This dramatic fall can be traced to the collapse in rural employment and incomes resulting from liberalization of the agricultural sector. Governments are often powerless to reserve this as policies imposed by the IMF/World Bank, such as removing subsidies for fertilizer or charging user fees for dipping cattle, directly affect the cost of agriculture inputs.

The current wave of liberalization and globalization is occurring in the context of massive concentration and control of the food system by corporations based in developed countries. Liberalization of agricultural trade has therefore further strengthened and consolidated an international division of labor in agriculture. In 1990, the Organization for Economic Cooperation and Development (OECD) controlled 90% of the global seed market. From 1970-1996, the OECD share of the volume of world cereal exports rose from 73% to 82%; the US remained the world's major exporter of commercial crops such as maize, soya bean and wheat; and the share of Africa, Latin America and Asia in world cereal imports increased to nearly 60% (Pistorius and van Wijk 1999). Liberalization has, on the whole, contributed to increasing inequalities within both developed and developing countries.

Multilateral collective strategies, at least the development of international standards and national legislation, are essential to protect and promote national food security and public health (Chopra et al 2002) and require strong leadership from international agencies. Civil society will have to play a more active role. The concept of food security must be recaptured and reframed in public health and environment terms.

India

Nutrition affects growth and development of a person. In 1990-92 the proportion of undernourished population was 24% which reduced to 22% in 2004-06 but marginal fall in more than one decade. In Under5 children the fall of undernourish children was high but overall proportion of underweight was 59.5% in 1988-92 and still 43.5% in 2003-08. Indian underweight children are contributing 42% of the world underweight children. In Hungama report-2011 underfive children malnutrition is 42% and below 24 months of age it is 42%. Percent of underweight newborn (<2.5gm) is 50%. Colostrum is not given in 51% of the cases and there is early weaning.

The sad story is maldistribution of food grain. On one side there is high prevalence of undernutrition in population and on other side the food grains are damaged in Government Godowns (Patnaik A. What India's growth story conceals.16th Oct 2010 TOI).

Malnutrition continue to be a major issue inspite of increase in monthly per capita expenditure. From 2,153 calories, consumption has steadily decreased to just 2020 calories in 2009-10 indicating distress (Min of Rural development 2013).

Food security has been a major goal of development policy in India since the beginning of planning. There was acute starvation and shortage of food at the time of independence of the country. Famine were common occurrence due to low agricultural production. The major public health problems were chronic energy malnutrition, kwashiorkor, marasmus and micronutrient deficiencies such as goiter, beriberi, blindness due to vitamin-A deficiency and anemia.

The constitution of India specifically in Article 47 has given responsibility to the State for raising level of nutrition and standard of living of its people and improvement in public health. Many interventions were undertaken during the last five decades such as green revolution, improving food distribution system through public distribution system (PDS), ICDS program, food for work scheme, Mid-day meal program, nutrition education and research, etc. India achieved self sufficiency in foodgrains in the 1970s and has sustained it since then. It has improved its capacity to cope with year to year fluctuation in food production. Many programs were implemented by the government through various ministries during the last 5 decades. They are direct and indirect interventions programs as described below:

Direct

1. Department of Women and Child Development

- Integrated Child Development Services (ICDS) Scheme
- Nutrition Program for Adolescent Girls
- Nutrition Advocacy and Awareness General Programs for Food and Nutrition Board (FNB)
- Follow up action on National Nutrition Policy 1993

2. Ministry of Health and Family Welfare

- Iron and Folic Acid Supplementation of Pregnant Women.
- Vitamin A supplementation of children of 9-36 months age groups.
- National Iodine deficiency Disorder Control Program

3. Department of Elementary Education and Literacy

- Mid-Day Meal for Primary School Children

Indirect

4. Department of Agriculture and Cooperation

- National Food Security Mission
- Increased Food Production
- Horticulture Interventions

5. Food and Public Distribution

- Targeted Public Distribution System
- Antodaya Anna Yojana
- Annapurna Scheme

6. Rural and Urban Development

- Food for Work Program
- Poverty Alleviation Program
- Safe Drinking Water and Sanitation Program
- National Rural Employment Guarantee Scheme

7. Ministry of Health

- National Rural Health Mission (NRHM)
- Integrated Management of Neonatal and Childhood Illnesses (IMNCI)
- Various Public Health Measures

8. Department of Elementary Education and Literacy

- Sarva Siksha Abhiyan
- Adult Literacy Program

9. Department of Women and Child Development

- Various women's welfare and support programs.

HISTORY

A number of programs were implemented in the past from time to time with minor successes or failures. Some of these are mentioned:

SPECIAL NUTRITION PROGRAM (SNP): The program was launched in the country in 1970-71. It provided supplementary feeding of about 300 calories and 10 grams of protein to preschool children and about 500 calories and 25 grams of protein to expectant and nursing mothers for six days a week. This program was operated under Minimum Need Program. The program was taken up in rural areas inhabited predominantly by lower socioeconomic groups in tribal and urban slums. Fund for nutrition component of ICDS Program was shared with SNP budget.

BALWADI NUTRITION PROGRAM: Fund for the supplementary feeding of Balwadi Nutrition Program was given by the Central Government which was launched in 1970-71 through voluntary organizations. It had provided 300 calories and 10 grams of protein per child (3-5 years) per day for 270 days a year.

APPLIED NUTRITION PROGRAM: The Applied Nutrition Program (ANP) was introduced as a pilot scheme in Orissa in 1963 which later on extended to Tamil Nadu and Uttar Pradesh with the objectives of: a) promoting production of protective food such as vegetables and fruits and b) ensure their consumption by pregnant and nursing mothers and children. During 1973, it was extended to all the state of the country. The Nutritional Education was the main focus and efforts were directed to teach rural communities through demonstration how to produce food for their consumption through their own efforts. The beneficiaries were children between 2-6 years and pregnant and lactating mothers. Nutrition worth 25 paise per child per day and 50 paise per woman per day was provided for 52 days in a year. No definite nutrient content had been specified. The idea was to provide better seeds and encourage kitchen gardens, poultry farming, beehive keeping, etc., but this program did not produce any impact. The community kitchens and school gardens could not function properly due to lack of suitable land, irrigation facilities, and low financial investment.

TAMIL NADU INTEGRATED NUTRITION PROGRAM: The Tamil Nadu Integrated Nutrition Project was started in 1980 targeting 6-36 months old children, and pregnant and lactating women. The objective of TINP were:

- To reduce malnutrition up to 50% among children under 4 years of age;
- To reduce infant mortality by 25%;
- To reduce Vit-A deficiency in the under 5 year from about 27% to 5%; and
- To reduce anemia in pregnant and nursing women from about 55% to about 20%.

The project had four major components:

1. Nutrition services,
2. Health services,
3. Communication, and
4. Monitoring and evaluation.

The projects were assisted by World Bank and with the goal of universalization of ICDS. All the TINP blocks were converted into ICDS blocks.

WHEAT BASED SUPPLEMENTARY NUTRITION PROGRAM: A centrally sponsored program was introduced in 1986 but now transferred to the State Sector. This program follows the norms of SNP or of the nutrition component of the ICDS. Central assistance for the program consist of supply of free wheat and supportive costs for other ingredients, cooking, transport etc.

CURRENT NUTRITIONAL DEFICIENCY STATUS

There is a wide gap in food production and food consumption. The achievement of macrofoodgrain security at the national level did not percolate own to household and the level of chronic food insecurity in India is still high. Many aspects of life and development are reflected in this one statistic – including the income and education of parents, the prevalence of disease,

Table 18.1: Prevalence rates of various diseases in India

Particulars		Prevalence
Infants and Preschool children (%)		
Low birth weight		22
# Kwashiorkor/Marasmus		<1
# Bitot's spots		<1-2
Iron deficiency anaemia (6 -59 months)		70.0
# Underweight (weight for age)* (<5 years)		42.6
# Stunting (height for age)* (<5 years)		48.7
# Wasting (weight for height)*		19.0
Childhood Overweight/ Obesity		6-30
Adults (%)		
Chronic Energy Deficiency *(BMI <18.5) among*		
# Rural Adults	*Men*	33.2
	Women	36.0
# Tribal Adults	*Men*	40.0
	Women	49.0
Anaemia (%)		
# Women (NPNL)		75.2
# Pregnant women		74.6
Iodine deficiency disorders (IDD)		
Goitre (millions)		54
Cretinism (millions)		2.2
Still births due to IDD (includes neo natal deaths)		90,000
Prevalence of chronic diseases *Over weight/obesity[4] (BMI>25) (%)*		
# Rural Adults	*Men*	7.8
	Women	10.9
# Tribal Adults	*Men*	3.2
	Women	2.4
Urban Adults	*Men*	36.0
	Women	40.0
Hypertension		
Urban		16.5
# Rural		25.0
Men		25.0
Women		24.0
# Tribal		24.0
Men		25.0
Women		23.0
Diabetes Mellitus *(%) (year 2006)*		
Urban		16.0
# Rural		5.0
Coronary Heart Disease[9] *(%)*		
Urban		7-9
# Rural		3-5
Cancer incidence Rate[10] *(Per 100,000)*		
Men		113
Women		123

*<Median -2SD of WHO Child Growth Standards
NNMB survevs

the availability of clean water, efficacy of health services, infant feeding practices, access to food and care, food and dietary habits, the health and nutritional status of mothers, and more broadly, the position of women in society. According to NFHS -3 in 2005-06, 46% of children below three years of age were underweight, 38% were stunted and 19% were wasted that are lower than Sub-Saharan Africa.

Approximately 26.1 % of the population is still living below poverty line. Undernourishment is higher among rural than urban children. The proportion of underweight children in urban areas was 36% as against 49% in rural areas. Similarly, levels of stunting and wasting are higher in rural than in urban areas (NFHS-3).

It is estimated that 2.2 million children are afflicted with cretinism and about 6.6 million are mildly retarded and suffer from motor handicaps. It is also estimated that iodine deficiency accounts for 90,000 still births and neonatal deaths. Nutritional blindness affects 7 million children in India per year resulting mainly from the deficiency of Vitamin A, couples with PEM. Prevalence of conjunctival xerosis and Bitot's spot was observed to be as high as 7.8% among slum children, followed by industrial labor (6.3%). Prevalence of Low Birth Weight babies in India ranged between 26% and 57% in the urban slums and 35% and 41% in rural areas. 40% of the adults in rural area and 50% of the tribal adults are suffering from chronic energy deficiency. There is a problem of overnutrition in certain areas and certain groups of people in the country which have serious health effects (Table 18.1).

India harvested 200 million tonnes of food grain as compared to 500 million tonnes harvested in China. In 2006 it was expected by Food Corporation of India that one million tonnes would be produced whereas normal requirement of food grain according to National Institute of Nutrition per capita per day should be 500 grams which make 4 million tonnes requirement. This requirement will exhaust the buffer stock existing in our store. This is due to decline in farm growth which was 4.5% in 1991-96 now it is 1.1%. All neighboring rural areas of urban cities are covered with development plan and agriculture land is changing into residential and commercial land which is a serious threat to the overall nutritional requirement of India (The Times of India 9th Feb 2006).

The relation between food energy intake and nutritional status is complex. This is because food energy intake is an inadequate measure of nutritional status. Various factors like non-nutrition food attributes, private and publicly provided inputs and the health status of the individual also affect nutritional status. It also gets affected by availability of safe drinking water, health care and environmental hygiene. The advances in the control of communicable diseases and improvement in health care significantly improved the efficiency of food energy.

The government has been implementing a wide range of nutrition intervention programs for achieving food security at the household and individual levels. Among these interventions ICDS and Mid-day meal program are major programs.

Challenges identified in the Review of Nutritional Interventions

- Growing demand of food production of growing population.
- Increasing food production at the Shrinking arable land and depletion of natural resources.
- Adverse consequences of globalization on domestic production, employment, etc.
- Persistence of severe undernutrition and under weight.
- Growing concern about micronutrient deficiencies.
- Association of undernutrition with HIV/AIDS.
- Alteration of life style and dietary intake and increasing incidence of obesity.
- There is no national system of nutrition monitoring mapping and surveillance. District level disaggregated data not available from NNMB and NFHS.
- Nutritional concerns are usually missing or not adequately presented in policies and programs of the government.
- Intersectoral coordination mechanism, crucial for nutrition promotion, is inadequate.
- ICDS coverage is not universal. States are not able to allocate resources for supplementary nutrition.
- Tribal areas, food scarce districts, chronically drought prone rural and tribal hamlets have

inadequate access to nutrition and health services.

- Nutrition Education and Awareness in general is weak.
- Coverage of children under 3 years in Vitamin A prophylaxis program is low.
- Iron and folic acid supplementation for preschool children, adolescent girls, pregnant women and lactating mothers is inadequate.
- Availability of iodized salt at household level had declined after the lifting of the ban on sale of non-iodized salt in October 2000. However, in 2005 ban on sale of non-iodized salt was strongly imposed in all states by the central government.
- Micronutrient malnutrition is not being addressed in a comprehensive manner.
- Food fortification program are negligible. Supplementation, dietary diversification and horticulture interventions are inadequate.
- Nutrition Program for Adolescent girls has only been implemented in 51 districts.
- Optimal infant and young child feeding practices need aggressive promotion.

National Nutrition Monitoring Bureau

The NNMB works under the aegis of National Institute of Nutrition, Indian Council of Medical Research. The specific objectives of the NNMB are to carry out diet surveys; to assess the food and nutrient intake at household and individual level; and to carry out anthropometry and clinical examination of individual to assess their nutritional status, on a continuous basis, on representative segments of the rural/urban/tribal population in the states, by adopting standard procedures and techniques; to evaluate ongoing national nutrition programs; to identify their strengths and lacunae and to recommend appropriate corrective measures (Brahmam 2007).

The NNMB unit has a team of five members consisting of one medical graduate, a nutritionist a social worker or an anthropologist, field attendant and a driver with a vehicle. The investigations include collection of household demographic and socioeconomic particulars, dietary intakes of household as well as individuals, anthropometric measurements of individuals like height/recumbent length, weight, mid-upper arm circumference and skin fold at triceps and examination for presence of clinical signs of nutrition deficiencies. In addition, secondary information at the village level such as population, agricultural production, nutrition and other development programs that are in operation also collected.

NNMB unit has been adopting sampling frame of Consumer Expenditure Survey, carried out every five years by the National Sample Survey Organization, for selection of a sub-sample of villages. In each of the villages, households are selected by cluster sampling procedure. For this purpose, the village is divided into 5 geographical areas, of which one formed the SC/ST household. In each of the geographical areas, a cluster of four consecutive household is covered, by selecting a random start. In all the twenty households thus selected, all individuals are covered for anthropometry and clinical examination. In a sub-sample of 10 households, diet surveys by 24 hour recall method are carried out to assess the food and nutrient intake of the individuals (Brahmam 2007).

Evaluation of National Nutritional Program (NNMB during 2001-02): The diet survey revealed that among 1-6 year children, except for roots and tubers, the consumption of various food like cereals and pulses was less than RDA. The intake of protective foods like green vegetables, milk & milk products, income elastic foods like fats and oils and meat/fish/eggs was very low, often then 20% -30% of Recommended Dietary Intakes (RDI) levels. The intake among the adults was relatively better where the requirement of cereals was met but that of pulses was still inadequate both in males and females. The median intakes of all the nutrients were below the recommended levels among both in 1-3 year, and 4-6 year children, while the intake of micronutrients like vitamin A, riboflavin and iron was grossly inadequate. There was no 'gender bias' with regard to food intake, in any of the age groups which is contrary to the general observation where female girls are victims (Brahmam 2007).

According to weight by age by Gomez classification it was revealed that only about 9% were normal, 6% were suffering from severe undernutrition while a majority (75%) had mild to moderate undernutrition. Nutrition grading of children according to Standard Deviation (SD) classification revealed that nearly 62% of both boys and girls of 1-5 year were underweight (weight for age <median -2 SD of NCHS). Similarly,

about 50% of boys had various degrees of stunting, while about 23% were having wasting. No gender differentials were observed in the prevalence of undernutrition. Distribution of adults according to body mass index (BMI), showed that the prevalence of chronic energy deficiency (BMI) less then 18.5) was about 37% in case of males, and 39% in case of females. The prevalence of undernutrition was relatively higher among low socioeconomic category of household such as those belonging to SC and ST communities (Brahmam 2007).

The data collected by NNMB over a period of time has shown that in spite of phenomenal increase is food production through 'green, 'white' and 'yellow' revolutions, the problem of undernutrition in India continues to be a public health problem. The increase in population size, low literacy level, recurrent drought conditions, increasing unemployment, and decreasing household food security status could be contributing to the dilution of the effects of development trickling down to the grass root level. Therefore, there is need to strengthen the existing national and other developmental programs such as supplementary feeding, micronutrient supplements, rural employment generation, public distribution system etc. There is need to improve health and nutrition education activities in the communities, through various media. Health and nutrition education has to be included in the educational curriculum (Brahmam 2007).

Initiatives of 10th Five Year Plan to have paradigm shift

- Household food security to nutritional security for family & individuals.
- Untargeted food supplementation in vulnerable group to screening of all persons to identify various grade of undernutrition and appropriate management.
- Lack of focused interventions on prevention of overnutrition to promotion of appropriate lifestyle and dietary intakes for prevention and management of over nutrition and obesity.
- Integration of various sectors to support the nutritional program for better output.

National Nutrition Goals for 11th Five Year Plan

- Reduce the prevalence of underweight in children under 5 years to 20%.
- Eradicate the prevalence of severe undernutrition in children under five years.
- First hour breastfeeding rates to increase to 80%
- Exclusive breastfeeding rates to increase to 90%
- Complementary feeding rate at six months to increase to 90%
- Reduce prevalence of anemia in high risk groups (infants, preschool children, adolescent girls, pregnant and lactating women) to 25%.
- Eliminate vitamin A deficiency in children under 5 years as a public health problem and reduce subclinical deficiency of vitamin A in children by 50%.
- Reduce prevalence of iodine deficiency disorders to less than 5%.

Strategies recommended for 11th Five Year Plan

A Articulating malnutrition as number one public health problem: Malnutrition is one of the most important contributory factors towards high infant and under 5 mortality rates and maternal mortality.

B. Nutrition Action by Health Sector at all levels.

- *Strengthening nutrition in medical, paramedical, AYUSH and Agriculture education*
- *Training programs for health personal*
- *Primary Health Care to include nutrition as important service*
- *Clinic/beds for severely malnourished children at PHC, CHC and district hospitals*
- *Establishing Nutrition Information System*
- *Infant and Young Child Feeding and Nutrition Security*
- *Creating Nutritional Awareness at all levels*
- *Micronutrient Malnutrition Control through Intensified Programs*

Double Fortification of salt: common salt fortified with both iodine and iron for controlling anemia. The technology of DFS developed by the NIN is based on a simple method of dry mixing of iodized salt with iron and does not involve elaborate or expensive measures. Large scale production of DFS (up to 60 MT) was successfully demonstrated in factories. NIN formulation of DFS contains refined common salt (100%), potassium iodate (0.0067%), ferrous sulphate hepta hydrate (0.508%) and sodium hexa meta phosphate (1%) as a stabilizer so as to provide 40

ppm iodine and 1000 ppm iron. NIN formulation of DFS showed good stability under the most adverse testing conditions. Sensory acceptability trials carried out using several commonly consumed Indian Foods containing DFS indicated that the DFS compared well with common salt in attributes such as taste, color, flavor, and overall acceptability. Iodine and iron are well absorbed and utilized in the body under dietary conditions prevailing in the country. A national program of manufacturing and distributing salt fortified with iodine and iron, folic acid and vitamin A is needed. Fortified Wheat Flour and Ready to Eat (RTE) foods: all the national schemes of food free distributions should supplied enriched food. Micronutrient enrichment of ICDS and Mid Day is also necessary.

Strategies recommended for 12th Five Year Plan

- **The ICDS strengthening and restructuring,** with special focus on pregnant and lactating mothers and children under three years.
- **A multi-sectoral programme to address maternal and child malnutrition** in selected 200 high-burden districts would be prepared. This programme will bring together various national programmes through strong institutional and programmatic convergence at the State, District, Block and Village levels. The monitorable targets, strategies and interventions of National Nutrition Policy NNP and National Plan of Action on Nutrition (NPAN) will be updated in the light of emerging policy directions. The updated National Plan of Action on Nutrition (NPAN) will be aligned with the Twelfth Plan
- **A nation-wide information, education and communication campaign** will be launched against malnutrition. A National Communication Strategy Framework (with contextualisation/ adaptation at State/District levels) will be developed. This will include an advocacy strategy that creates the necessary priority and media environment for nutrition; a social mobilisation strategy that mobilizes communities and resources for concerted action and a behavioral development strategy for changing key care behaviours at field level. A nation-wide communication campaign coordinated by the Ministry of Women and Child Development, in consultation with the Planning Commission and Ministry of Health and Family Welfare, will be launched against malnutrition.
- The Ministries that deal with Health, Drinking Water Supply and Sanitation, School Education, Agriculture and Food and Public Distribution will **bring strong nutrition focus** to their programs.

Recommentations of Action Group on Nutrition

Key recommendations are made by members of the Action Group on Nutrition (Govt of India 2013):

1. Existing platform of JSY, VHND, and VHSNC should be used for promoting IYCF and addressing nutrition issues.
2. Dedicated, focussed IEC, BCC strategy and campaign is required on nutrition.
3. Rapid coverage with IFA while ensuring the quality of Iron folic acid supplies is required to address anaemia.
4. Special attention to low birth babies is required; guidelines may be developed for quick reference by ANMs.
5. Monitoring of nutrition interventions should be made a part of institutional mechanism (HMIS).
6. Growth monitoring is screening process, but importantly it should be linked with action.
7. Human resources in terms of **'Health Worker: Population Ratio'** should be taken into account; besides optimising human resources /team at block level. A gaps and situation analysis can be done at district level.
8. Policy on NCD should include children 0-2 years.
9. Malnutrition implies both under nutrition and obesity and should be taken into account in all future plans.
10. Food, water and sanitation have to be addressed as part of a comprehensive strategy to impact nutrition status.
11. Technical guidelines issued by the Ministry should be disseminated to training institutions, ANM training centres, medical and nursing colleges.
12. Nutrition Counselling Centres may be established in health facilities to support and counsel mothers/caregivers.
13. Nutrition should be an integral part of all discussions across ministries.

14. Unified District Action Plan can be developed, while considering district as one comprehensive unit.
15. Human resources at central level may be enhanced in terms of numbers
16. `Setting up a National Technical support unit for nutrition (on similar lines as for HIV) can be considered.
17. Home visit for IYCF can be introduced and linked to cash incentives.
18. Group counselling should be undertaken for increasing breastfeeding rates (through VHND and any other available platform)
19. Role clarity of frontline workers is required.
20. Weight recording requires necessary logistics to be in place and the role of a logistics agency can be considered.
21. Ten steps for promotion of breastfeeding should be followed in health facilities.
22. Research priorities for nutrition must be identified.
23. Maternal malnutrition must be addressed to reduce child malnutrition.

18A. INTEGRATED CHILD DEVELOPMENT SERVICE (ICDS) SCHEME

Integrated Child Development Service (ICDS) scheme was launched on 2nd October, 1975 (5th Five Year Plan) in pursuance of the National Policy for Children in 33 experimental blocks. The network consists of 5659 projects in rural and urban slum pockets. Now the goal is universalization of ICDS throughout the country.

The primary responsibility for the implementation of the program is with the Department of Women and Child Development, Ministry of Human Resources Development at the Center and the nodal departments at the state which may be Social Welfare, Rural Development, Tribal Welfare, Health & Family Welfare or Women and Child Development.

BENEFICIARIES

1. Children below 6 years,
2. Pregnant and lactating women,
3. Women in the age group of 15-45 years,
4. Adolescent girls in selected blocks.

Initiatives Recommended by the National Consultation in year 2001:

1. The frequency of weighing for growth monitoring for each child should be reduced to every three months. The growth monitoring activity may be replaced by "Nutritional Assessment and Nutritional Counseling (NANC)" sessions;
2. Counseling of mothers with objective of changing their behavior for adopting good practices in the field of nutrition and health;
3. The existing growth chart should be simplified to a simple family held Child Card, which should include other parameters on the child (including development milestones) and Key messages related to Child Caring and Feeding.
4. The community growth chart should be discontinued;
5. Supplementary food should be viewed and used only as a magnet/vehicle for providing other services under ICDS scheme. Supplementary food should be essentially cereal based, palatable and of good quality. It should be suitable for use in children below 1 year of age;
6. Fortification of supplementary food may be considered for iron only. Policy guidelines of Ministry of Health for management of micronutrient deficiency anemia, iodine deficiency disorders, vitamin A deficiency etc., should also be followed in ICDS Program.
7. For community based rehabilitation of severely malnourished children, participation of health workers for management of infections with other support interventions is critical.
8. Operational research is required in selected regions of the country before AWW can be given the responsibility of care of normal neonates and low birth babies.
9. Prioritizing the work responsibility of AWWs keeping in view the educational status, time available, honorarium paid and records to be maintained.

National Institute of Nutrition had developed iron and iodine fortified salt, which if used by the population

could result in substantial improvement in the iron intake of all the population groups. It has been field tested and found to be effective. Other agencies have also developed salt fortified with iron and iodine and other micronutrients. Some states like Chhatisgarh have provided iron and iodine fortified salt at a subsidized cost through Public Distribution System. State like Uttaranchal has introduced double fortified salt in ICDS.

12th Five Year Plan

The restructured ICDS is a critical component in the Twelfth Plan strategy for child development. The reformed and strengthened ICDS embodies a genuinely integrated life cycle approach to early childhood care and development—transforming AWCs into vibrant, child friendly ECD centres, to be ultimately owned by women in the community.

- Repositioning the AWC as a vibrant, child friendly ECD centre (Baal Vikas Kendra) which will ultimately be owned by women in the community. This will have expanded/redesigned services, extended duration (6 hours), with an additional AWW provided initially in 200 high burden districts and with piloting of creche services in 5 percent of AWCs. These would function as the first village outpost for health, nutrition, early learning and other women and child related services. This would include the provision of adequate infrastructure, facilities such as safe drinking water, toilets, hygienic SNP arrangements, wall painting, play space and a joyful early learning environment including provision for activity corners, and anchoring of other services for maternal, child and care for out of school adolescent girls through the Rajiv Gandhi Scheme for Empowerment of Adolescent Girls. Greater ownership by women and communities would also come with institutional reforms that include the establishment of Anganwadi Management Committees, which include mothers/mahila mandals/parents as members, empowered with untied funds for local action.
- Re-designing and reinforcing of the package of ICDS services, including a new component of Child Care and Nutrition Counselling for mothers of children under three years.
- Enhancing Nutritional Impact with revised nutrition and feeding norms; ensuring provision for nutritious, freshly cooked, culturally appropriate meal, (morning) snack and Take Home Rations in harmony with Supreme Court directives and the IMS (and its Amendment) Act and greater involvement of women's SHGs. Piloting of community kitchens and joint kitchens with Mid Day Meals will also be undertaken. An innovative new component is SNEHA SHIVIRS for promoting community based prevention and care of severely undernourished children, backed by stronger referral linkages with the health system (Nutrition Rehabilitation Centres under NRHM). *Sneha Shivirs* include 12 day Nutrition Care and Counselling Sessions at AWCs, using positive role model mothers, whose children are growing well, for demonstrating positive care practices, cooking and feeding, (with mothers' contribution) to mothers of undernourished children in similar community environments. This improves family care and feeding behaviours (Learning By Doing) through sustainable approaches, enhancing local caregiving capacities through peer counselling, demonstrating positive care practices and enabling change, using local resources—touching the lives of young children and their communities.
- Strengthening Early Childhood Care and Education (ECCE) by redefining ICDS non formal preschool education to ECCD, with additional and trained human resources, introduction of a developmentally appropriate curriculum framework with joyful learning methodologies. This will be supported by the use of local culturally relevant play/ activity materials, AWC activity corners and local toy banks in child friendly AWC environments.
- Ensuring convergence with related sectors such as NRHM, TSC, NRDWP, SSA, MGNREGA through joint planning, inclusion of young child related concerns in State/District Annual Programme Implementation Plans (APIPs) of relevant sectors, joint monitoring of key results and indicators and defined roles and accountabilities.
- Institutional Reforms aim at transforming ICDS into a "Mission Mode." decentralised program,

with a flexible implementation framework with monitorable outcomes for improved effectiveness, efficiency and accountability.

- Progressive devolution of powers to Panchayati Raj Institutions and Urban Local Bodies is envisaged. The emphasis is on reinforcing the AWC as a village habitation level institution owned by the community, with the leadership and support of panchayati raj institutions.
- Strengthening of ICDS Management Information System (MIS) This would be revamped to focus on real time data for assessment, analysis and action, closest to the level at which data is generated, using Information Communication Technology (ICT) and the reach of mobile telephones.
- Community owned ICDS accreditation system will be introduced to ensure quality standards in child care service delivery at all levels, with grading of AWCs, sectors, block/projects, districts, based on child related outcomes, using a checklist based on service standards.
- Integrated Child Development Services Systems Strengthening and Nutrition Improvement Project (ISSNIP) will also be implemented in 162 high burden districts of 8 states, reinforcing the strengthening and restructuring ICDS, and enhancing child nutrition and development outcomes.
- Indira Gandhi Matritva Sahyog Yojana (IGMSY)—the Conditional Maternity Benefit Scheme will be expanded in the Twelfth Plan.

Objectives of ICDS

- to improve the nutritional and health status of preschool children in the age-group of 0-6 years;
- to lay the foundation of proper psychological development of the child;
- to reduce the incidence of mortality, morbidity, malnutrition and school dropout;
- to achieve effective coordination of policy and implementation amongst the various departments to promote child development; and
- to enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education

Scheme for Adolescent Girls (*Kishori Shakti Yojana*)

There was a gap between women and child age group which was not covered by any health and social welfare program whereas girls in this crucial group need special attention. On one side they need appropriate nutrition, education, health education, training for adulthood, training for acquiring skills as the base for earning an independent livelihood, training for motherhood, etc. Similarly on the other side their potential to be a good community leader has to be realized. A scheme for adolescent girls in ICDS was launched by the Department of Women and Child Development, Ministry of Human Resource Development in 1991.

Objectives

i. To provide the required literacy and numeric skills through the non-formal stream of education.
ii. To stimulate a desire for more social exposure and knowledge and to help them improve their decision making capabilities.
iii. To improve the nutritional, health and development status of adolescent girls, promote awareness on health, hygiene, nutrition and family care,
iv. To link them to opportunities for learning life skills, to train and equip the adolescent girls to improve/ upgrade home based and vocational skills.
v. To help them gain a beter understanding of their social environment and take initiatives to become productive members of the society.

Common Services: All adolescents girls in the age group of 11-18 years (70%) receive the following common services:

1. Watch over menarche,
2. Immunization,
3. General health checkups once in every six-months,
4. Treatment for minor ailments,
5. Deworming,
6. Prophylactic measures against anemia, goiter, vitamin deficiency , etc., and
7. Referral to PHC/District hospital in case of acute need.

This scheme for adolescent is extended to adolescent girls in 6118 ICDS blocks covering all states and UTs. **Financial** support is Rs. 1.10 lakh per ICDS project per annum.

The Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG) Sabla

The Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG) Sabla is a centrally sponsored program of Government of India initiated on April 1, 2011 under Ministry of Women and Child Development and 100% sponsored by Central Government. In selected district this program will replace the Nutritonal Program for Adolescent Girls and Kishori Shakti Yojana.

The objectives of the program are:
Enable the Adolescent girls for self-development and empowerment
Improve their nutrition and health status.
Promote awareness about health, hygiene, nutrition, adolescent reproductive and sexual health (ARSH) and family and child care.
Upgrade home-based skills, life skills and integrate with the National Skill Development Program (NSDP) for vocational skills.
Mainstream out of school adolescent girls into formal/ non formal education.
Provide information/guidance about existing public services such as PHC, CHC, Post Office, Bank, Police Station, etc.

An integrated package of services is to be provided to adolescent girls as follows:

- Nutrition provision
- Iron and Folic Acid (IFA) supplementation
- Health check-up and Referral services
- Nutrition & Health Education (NHE)
- Counseling/Guidance on family welfare, ARSH, child care practices and home management
- Life Skill Education and accessing public services
- Vocational training for girls aged 16 and above under NSDP.

The program covers adolescent girls 11–18 years old under all ICDS projects in selected 200 districts in all states/UTs in the country. The target group would be subdivided into 11-15 and 15–18 years

ORGANIZATION

The Anganwadi

The *Anganwadi*, literally mean a courtyard play center, is a child-care center located within the village or the slum area itself. It is the focal point for the delivery of services at community levels to children below six years of age, pregnant women, nursing mothers (15-45 yrs of age) and adolescent girls. Besides this, the Anganwadi is a meeting ground for women, mothers and other social and health workers for discussion, awareness programs, joint action for child development and women's empowerment. Each Anganwadi is run by an Anganwadi Worker (AWW) supported by a helper who provide integrated service delivery and improved linkages with the health system-thus increasing the capacity of community and mothers-for child-care, survival and development.

Each *anganwadi* covers approximately 1000 population in rural and urban areas. The norms are given below:
For Rural/Urban Projects
400-800 1 AWC
800-1600 - 2 AWCs
1600-2400 - 3 AWCs
Thereafter in multiples of 800 1 AWC
For Mini-AWC
150-400 1 Mini-AWC
For Tribal /Riverine /Desert, Hilly and other difficult areas/ Projects
300-800 - 1 AWC
For Mini- AWC
150-300 1 Mini AWC

Government is setting up Mini-Anganwadis to cover the remote and low populated hamlets/ villages in tribal blocks. There are Mini anganwadi which covers 150-500 population in rural areas, 500-1500 in urban areas and 150-300 in tribal areas. The Supreme Court has ordered to raise monetary amount for free nutritional food norm from Rs. 2 per child to Rs. 4. For severely malnourished children (6-72 months) the revised rates are Rs. 6 per child per day. For pregnant Rs. 5 per pregnant/lactating per day.

These norms per child /beneficiary are revised by the government of India (Govt. of India 2009) as follows:

1) Children (6-72 months)= Rs. 4.00; calories 500 and protein 12-15 gm.
2) Severe underweight children (6-72 months) Rs. 6.00; calories=800 and protein = 20-25 gm.
3) Pregnant women and nursing mothers=Rs. 5.00, calories=600 and protein =18-20 gm.

The Anganwadi provide a package of services which are depicted in Figure 18A.1. These are follows:

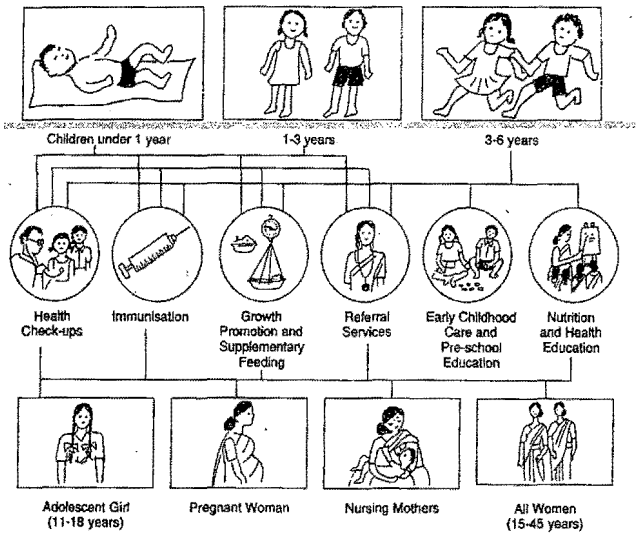
Health
- Immunization
- Health Checkup
- Referral Services
- Treatment of minor illnesses

Nutrition
- Supplementary Nutrition
- Growth Monitoring and promotion
- Nutrition and health education

Early Childhood care and Pre-School Education to children of 3 to 6 years

Convergence
- Of other supportive services, such as safe drinking water, environmental sanitation, women's empowerment Programs, non-formal education and adult literacy.

Figure 18A.1 : Service and Beneficiaries of ICDS



Nutrition is provided in terms of calories and proteins as given in table 18A.1.

Table 18A.1: Calories and Protein given in ICDS

Recipients	Calories	Grams of Protein	Rs.
1. Child up to 6-72 months	500	12-15	4
2. Adolescent girls	500	20-25	4
3. Pregnant and Nursing Mothers	600	18-20	5
4. Malnourished children	800	20-25	6

Note: Higher calories and protein is recommended in 11th Plan.

Anganwadi worker

Anganwadi worker is a part-time trained voluntary worker and receives an honorarium of Rs. 1500 per month. She is assisted by a helper who is also a local women and paid an honorarium of Rs. 750. She maintains the growth chart of every child and weighs each child under the age of 3 years each month. Children over the age of 3 years are assessed with an upper mid-arm circumference. If any child has MAC less than 13.5 cms (in the red or yellow zone of the tricolored strip used for the upper mid-arm circumference) then child should be weighed every month.

She organizes non-formal education for children of 3-6 years age group. She teaches mothers on health and nutrition. She coordinates with PHC staff for the health checkup, immunization and referral of suffering children. She provides treatment of minor illnesses. She maintains all files and records of services provided and growth of the children and submit the report every month to *Mukhya Sevika*. She organizes supplementary nutrition feeding for children (0-6 years) and expectant and lactating mothers by planning a menu based on locally available foods. She carries out a quick sample survey of the area and families to find out the total beneficiaries.

Mukhya Sevika (MS)

She is a full time worker who supervises the work of 20, 25 and 17 *anganwadi* workers in urban, rural and tribal projects respectively. She visits each anganwadi at least once a month, and coordinates with lady health visitor in nutritional and health activities.

Child Development Project Officer (CDPO)

For one project there is one CDPO who covers one community development block having a population of 80,000 to 120,000. S(h)e supervises, coordinates and guides the work of entire ICDS project as an in-charge and supervises 4-5 Mukhya Sevikas. He/she is assisted by one assistant CDPO.

Role of the Health Department

It provides following health services:

a) Health checkup,
b) Handling the referrals from Anganwadi,
c) Immunization is carried out by health workers female,

d) Health and nutritional education,
e) Continuing education of ICDS staff, and
f) Monitoring of the health component of ICDS.

Health infrastructure

1. *Director Health Services or Director Family Welfare and MCH (RCH)* is honorary state coordinator of ICDS, who facilitates the implementation of ICDS, ensures adequate supply of medicine, vaccines, equipment etc., organizes training, coordinates activities with ICDS staff and his subordinates.
2. *Senior Advisor* is a senior official of the Health & Family Welfare department who ensures that ICDS projects of the state are being monitored regularly, continuing education at the sectoral level and submitting the quarterly report to the central cell and state coordinator.
3. *Official-in-charge Analyzer* (ODA) is another official of the health department who ensure submission of state coordinators quarterly report, assist state coordinator and who takes part in training courses.
4. *Divisional Adviser* is a Deputy Director, or Joint Director, or Addl. Director who reviews ICDS Program implementation, coordinates with district officials, Program officials and organizes meetings.
5. *Chief District Advisor* is the head of the medical and health department at the district (Chief Medical Officer) who organizes and supervises all activities at district.
6. *District Advisor* is a deputy CMO, Addl. CMO, District TB, Malaria or Leprosy Officer who supervises one of the 3-4 ICDS projects of the District.
7. *Project Advisor* is the official in-charge of the community health center who supervises and coordinates the continuing education with other medical officers and prepares monthly monitoring report and attends monthly district level meetings.
8. *Sector advisor* is one of the medical officer of the CHC who is designated as sectoral advisor. In each ICDS project there are 3-4 sectors at the community level. Sector advisor takes sessions for continuing education, arranges a monthly meeting with all anganwadi workers, LHVs, Mukhya Sevikas, etc.

Indicators for Analysis of ICDS Reporting Data (at all levels)

Monthly Basis

1. *Enrollment efficiency at the AWCs*

   Department would like to optimize the enrollment of targeted group. Maximizing enrollment does not ensure maximum coverage but the vision is to improve coverage.

   Enrollment efficiency = (number of children 0-6 years and P&LM)/ total number of children 0-6 years and P&LM X 100
2. *Weighment efficiency at all levels*

   As per norms, the weighment may be done under the ICDS Scheme.

   Weighment efficiency = (number of children 0-6 years weighed)/ total number of children 0-6 years in the area X 100
3. *Rate of Moderate or Severe malnutrition*

   One of the objectives under ICDS Scheme is to reduce the incidence of malnutrition viz. moderate malnutrition and severe malnutrition. For the first time, department may like to include the Grade-I children in calculating the moderately malnourished children.

   Rate of Moderate malnutrition = (number of children in Grade-I & II)/ total number of children weighed X 100

   Rate of Severe malnutrition = (number of children in Grade III & IV)/ total number of children weighed X 100

   The sum of rate of moderate and severe malnutrition will give the total rate of malnutrition.
4. Projects and AWCs : Operational vs. Sanctioned

Annual Basis

Indicators of monthly basis plus the following:

5. % of children fully immunized (i.e. children given 1st dose of OPV and BCG in first month) and major reasons of partial immunization.
6. % of AWC that provided supplementary nutrition for 300 days in a year.
7. % AWC housed in own building vs rented vs others (like AWW's house, Helper's house, Panchayat house, in primary school etc.).
8. % operational AWC vs AWC with toilet facility and/ or drinking water facility.
9. % children who left AWC and enrolled at primary school i.e. enrolment efficiency.
10. % children under various degrees of malnutrition.
11. Trend analysis of normal, moderate to severe malnourished children and vice versa.
12. % children with Low Birth Weight.

13. % children breastfed with colostrum and % children (< 6 months) exclusively breastfed for the first six months.
14. Average number of AWCs visited by Supervisor in a year/ month.

ACHIEVEMENTS

Expenditure on the program was 3,103.08 crores in 2007-08 and 4,306.82 crores in 2009-10. As against 2.27 crore beneficiaries until March 1997, there were 7.95 crore children below 6 years and 1.84 crore pregnant and lactating mothers beneficiaries in by Oct 2011. 12.86 lakh anganwadi centers (AWC) are operational and up to 1.2 lakhs AWCs more bring set up.

Implementation is closely monitored at regular intervals. Department of Woman and Child Development has installed a microcomputer and a special software has been developed for ICDS for periodic monitoring and quarterly status reports. Performance reports are sent to the states nodal departments. Copies of reports sent to the Planning Commission, PM Office, Department of Program implementation indicating its importance given by the Government.

In spite of big infrastructure developed under ICDS Program the nutritional status of the women and children remain allmost same as of previous years. Reasons for lack of improvement in nutritional status in ICDS areas include:

1. Inadequate coverage of children below 3 years of age who are at greatest risk of malnutrition. It is provided in the Program that 0-6 years children will be covered however in reality only 3-6 years age group is covered. Very little is done to cover the 0-3 years age group children. Similarly pregnant and lactating women hardly benefited from this Program.
2. Irregularity of food deliveries to anganwadis and hence irregular feeding and inadequate rations.
3. Poor nutrition education to improve feeding practices at home.
4. Inadequate training of workers in nutrition, growth monitoring, and communication.
5. Poor supervision.
6. Poor coordination and linkage with health workers.
7. Lack of community ownership and participation.
8. Poor quality of feed which is not well accepted by majority of children.

Insurance scheme for Anganwadi Workers

Anganwadi workers and helpers in the country who would be covered under insurance scheme providing Rs. 50000 in case of accidental death or permanent disability and Rs. 20000 for death other than by accident. Under the insurance scheme, each worker would be covered with an annual premium of Rs. 280. This is done as a part of providing risk coverage for workers in the unorganized sector. Each worker would pay Rs. 80 and Union government and the Life Insurance Corporation of India (LIC) would contribute Rs. 100 each towards the scheme.

UDISHA – The ICDS Training Program (1999-2004): UDISHA is a World Bank assisted countrywide training program for all ICDS functionaries. It has three main components, viz. **i.** Regular Training (wherein basic job training is provided to ICDS functionaries), **ii.** Other Training (wherein innovative, area specific trainings are provided) and **iii.** IEC, etc. National Institute of Public Cooperation & Child Development (NIPCCD) was involved in training and in 2007 the evaluation of the project was carried out by Indian Institute of Development Management.

World Bank Project: ICDS Systems Strengthening and Nutrition Improvement Project (ISSNIP) was approved a US$ 106 million credit loan in 2012 to focus on improving services for pregnant/lactating women as well as for children less than three years of age. The first phase of the Project will be implemented over a three-year period, to be followed, upon the successful achievement of its results, by a four-year second phase. Policy and institutional reforms as well as innovative pilots and programs will be tested in eight high-burden states, with a special focus on 162 high malnutrition-burden districts in these states.

COMMENTS

1. Child Survival components of RCH are similar to the services package of ICDS. The main program activity is nutrition and informal education of children who are little older than the age group covered in RCH program, so the coordination of

these two programs implementation need to be streamlined and duplicacy of services should be avoided.

2. According to Hungama report 2011 96% of the villages have anganwadi but in 61% of the cases it is found in pucca house. Only 50% of the angawadi were providing food at the time of survey and only 19% of the cases nutritional counseling was given. It has been observed that the children are visiting to most of the anganwadis at the time of distribution of food supplementation which indicates that no other activity is being carried out. Infrastructure of anganwadi is not adequate at majority of places. Not all the components of the service package get the priority in service delivery. Central thrust remains supplementary nutrition, and other components such as immunization, antenatal check up, advise on feeding practices, and health monitoring of weight of all children seldom occurs, that have a significant impact on overall health.
3. Staff of ICDS has not given much emphasis on community participation, nutrition, and health education.
4. Nutritional therapy to the severely malnourished child is not carried out seriously.
5. Referral system and home visits are not practiced properly and adequately.
6. Most of the time the selection of ICDS project is done without observing guidelines and closely influenced by local power factors. Mismanagement of funds is also observed in some states, e.g., the High Court of Delhi ordered inquiry to Delhi government over misappropriation of ICDS funds (TOI 25 Dec 2005).
7. AWW has not been accorded the dignity and prestige as a voluntary worker.
8. The role of supervisor is marginal and the CDPOs skills require improvement.
9. Their security is also a concern because there are incidences of rape of these workers (The Hindu 2006; 27 Jan)
10. Overall impact of ICDS on malnutrition is very limited (Radhakrishna 2005). Underfive malnutrition is still very high (42% Hungama report 2011). Similarly birthweight is also below 2.5 kg in 50% of the cases in focused areas. One of the reasons could be due to a meager allocation of budgetary resources and faulty project design. The program is regressively distributed between states. The states with high incidence of malnutrition such as UP, Bihar, Jharkhand, Orissa, Madhya Pradesh, Rajasthan have a relatively low coverage. According to one Public Interest Litigation (PIL) only 20% of allocated money per beneficiary is spent on food and rest 80% is spent on transport and infrastructure (HT 22nd March 2010).
11. Tamil Nadu, despite having a relatively good Integrated Child Development Service (ICDS) program and showing significant improvements in the delivery of healthcare has managed to reduce the proportion of underweight children by a mere 4 percentage points. This suggests that reducing child malnutrition requires more than a well- functioning anganwadi center, i.e., care of the newborn and under three years need special attention.
12. Poor quality of services including non-palatable food supplements. Irregular supply of food and medicine by the state government and reduction in quantity when food is supplied (NIN 1992). Satisfaction level of the community was 47.5% in Delhi according to one study (Davey A et al 2008). The reasons for non-satisfaction were non-availability of AWW, less of space at AWC, poor quality of food, irregular pre-school education, no frequent change in recipe and no immunization at a center. Lack of community participation either in the running or monitoring the functioning of ICDS. It is suggested that coverage should be expanded when quality of services are improved (Measham 1999).
13. The system of central technical committee was discontinued in year 1999-2000 and the formal linkages with medical colleges and universities were abandoned. However, in Tenth & Eleventh five plans it has been emphasized that such convergence between Department of Women and Child Development and medical colleges should be continued for quality of services and universalization of ICDS.
14. The effect of major socioeconomic changes, including increasing urbanization, structural transformation of the economy and displacement, and their relationship to undernutrition need to be better concretized. The starvation deaths reported in Kashhipur in 2002, for instance, were linked to the government's acquisitions as a food source.

In West Bengal and Kerala, starvation deaths have been reported among workers in the tea gardens as the industry goes through the doldrums due to low commodity prices. In Madhya Pradesh, the large scale displacement of dam construction and lack of livelihood opportunities has affected the nutritional status of a generation of children, though its explicit articulation might not be readily available. Starvation deaths among children has been reported from Jhabua Ratlam district of Madhya Pradesh which is linked with poor health care facilities (Mail Today 2010; March 10). In metropolises such as Delhi, the relocation of entire communities during construction of New Delhi in early 20th century, and later acquisition of agriculture land during 1960s and 1970s and people living near the Bank of Yamuna to make way of 'redevelopment' has disrupted the lives of children and impoverished their families (Kishore 2005, EPW 2006).

Achieving target of reduction in undernutrition will not give results when the situations that create and perpetuate malnutrition are ignored. These concerns should be reflected in the development plans of states and relief and rehabilitation packages, so that policy making is not hampered by a watertight department approach (EPW).

18B. MID-DAY MEAL PROGRAM

One of the pioneers of the scheme is the Madras Presidency that started providing cooked meals to children in corporation schools in the Madras city in 1923. The program was introduced in a large scale in 1960s under the Chief Ministership of K. Kamaraj Nadar. But the first major thrust came in 1982 when the then Chief Minister of Tamil Nadu, Dr. M. G. Ramachandran, decided to universalize the scheme for all children in government schools in primary classes. Later the program was expanded to cover all children up to class 10. Tamil Nadu's mid-day meal program is among the best known in the country. Several other states of India also have had mid-day meal programs. The most notable among them is Gujarat that has had it since the late 1980s. Kerala started providing cooked meals in schools since 1995 and so did Madhya Pradesh and Orissa in small pockets. On November 28, 2001 the Supreme Court of India gave a landmark direction, which made it obligatory for the government to provide cooked meals to all children in all government and government assisted primary schools. The direction was resisted vigorously by State governments initially, but the program has become almost universal by 2005.

Neither a child that is hungry, nor a child that is ill can be expected to learn. There are about 150 million children officially enrolled in nearly 8,00,000 schools throughout the country. Relatively high overhead costs of school coupled with poor school infrastructure, lack of structure, lack of teachers and teacher absenteeism are the most often cited reasons for low levels of schooling in the country (PROBE 1996). Realizing this need the National Program of Nutritional Support to Primary Education, popularly known as Mid-Day Meal (MDM) Scheme was formally launched on 15 August 1995 with the aim of improving in three areas:

- School attendance,
- Reduced dropouts,
- A beneficial impact on children's nutrition

Beside these, MDM could be a valuable means of imparting health and nutrition education not only to children but also to the parents and the community. MDM could also create employment opportunities for poor women of the village. Majority of cooks engaged in the programs could be women, most of them coming from underprivileged backgrounds. Mid day meal has been effective in improving enrolment rates particularly of girls (Dreze & Goyal 2003). From October 2002, the program has been extended to children studying in government supported schools.

The program covered around 112 million children (beneficiaries) in class I to V through government, local body and private-aided primary schools. Foodgrains at the rate of 3 Kgs. minimum per child

are provided per month for 10 months (300 kcal and 8-12 grams of protein per child per day). The Central Government supplies the full requirement of foodgrains for the program free of cost. For its implementation in rural areas, *Panchayats* and *Nagarpalikas* are also involved for setting up of necessary infrastructure for preparing cooked food. For this purpose NGOs, women's group and parent-teacher councils can be utilized. The total charges for cooking, supervision and kitchen are eligible for assistance under *Poverty Alleviation Program*. In several states, supplementary feeding was assisted by food supplies from Cooperation for American Relief Everywhere (CARE). However, due to various logistic and financial problems this program had not been sustained in many places. The problems were-1) the program was not based on an agreed National Policy fully backed by the Central and state governments and 2) the program was mostly implemented as isolated bureaucratic operations with no meaningful involvement of the community on one hand and with no serious attempt to integrate this program as an element of a comprehensive effort towards the up gradation of the entire school system. At the same time poor quality of food has added more complications.

Following recommendations are made in a report by Nutrition Foundation of India:

- The children in classes 1-8th could be included as beneficiaries of the program, as being practiced in the states of Gujarat and Tamil Nadu.
- Each MDM should provide roughly a third of the daily nutrient requirement (350-500 Kcal depending on the age of the child). The meal should contain apart from cereals, a good quality of vegetables, particularly, dark green leafy vegetables to combat micronutrient deficiencies.
- Meal should be of hygienic quality that demands monitoring of the raw material and cooked preparation by trained personal.
- In urban areas a centralized kitchen should be set up and meal should be prepared, transported, and served hygienically. This model was adopted by Chennai and Naandi Foundation in Hyderabad and ISKON group in Bangalore. In rural areas self help groups and Panchayat should be involved.
- Mobilization of funds and Rs. 2.50- Rs. 2.75 per child per meal should be allocated through various existing schemes.
- Convergence of synergistic activities: School health services, environmental sanitation and safe water supply, sensitization of teachers, involvement and networking of professional bodies and communities.
- In an analysis of the mid-day meal program in Madhya Pradesh it was recommended on the basis of that analysis every state should have a separate fund for effective implementation of the scheme. There is a need to create the right kind of institutions which have a stake in ensuring that the program functions uninterruptedly and these funds reach the intended beneficiaries through the nutritious supplementary meal (Afridi F 2005).In such situations, UNICEF had distributed Plumpy'Nut, categorized as a ready-to-use therapeutic food (RUTF). WHO considers it nutritious. RUTFs have been used in several African countries and yielded positive results among the severely malnourished population there. But imported RUTFs are not acceptable in India according to health ministry because it is not experimented in India and it cost more as compare to locally available food.

12th Five Year Plan

During the Twelfth Plan, MDMS will be expanded to cover pre-primary schooling in a progressive manner, private unaided schools, particularly in the SC/ST and minority-concentrated areas, and poor children admitted in neighborhood private schools. Partnerships with panchayats and municipalities, as well as with other NGOs and government agencies may be developed to ensure good-quality, nutritious and regular supply of food to all children. Full convergence of the MDMS with the school health program would be ensured during the Twelfth Plan to benefit from synergy in two programs. The monitoring system under MDMS would be made more effective during the Twelfth Plan. An MIS portal for monitoring of the scheme has already been launched. The MIS would be integrated with Interactive Voice Response System to capture the information on daily basis and monitor the Scheme on real time basis. The MIS would enable the States/UTs and Central Government to plan the visits to the poorly performing area of the respective States. It will also be used as a mechanism for social audit.

COMMENTS

1. Program is good as far as improving nutrition of underprivileged section of the society is concerned. But such program needs sustainability which depends on political will, community participation, monitoring and evaluation and quality of services.
2. Many barriers have been recognized in the successful implementation of the program such as an ineffective mechanism for monitoring and evaluation, inferior food quality, non-adherence to the recommended protocols (viz. the practice of hand-washing before food preparation and eating by the students/ cooks/ supervisors/ teachers, tasting food before serving, provision of safe and wholesome water, and adequate sanitation practices) while preparing the food, and occurrence of a lifethreatening event subsequent to the consumption of mid day meal in the schools (Srivastava et al 2015).
3. Caste and Gender bias continued to affect the performance and achievement of the scheme. caste and gender bias is strong in Rajasthan, Odisha, Karnataka, Madhya Pradesh. It is found that previleged caste children were not sharing mid-day meals with downtrodden and underprevileged caste children in Rajasthan. In many schools the meals is separately served for both the groups. In Madhya pradesh, previleged caste children do not eat meal cooked by underprevileged caste person (Mukul A. TOI 5th August 2012 pp. 17).
4. To improve the nutritional quantity and quality of the NP-MDMS, Deodhar et al (2010). have recommended that, in addition to the mid-day meal, school children should also receive sukhdi or chikki or a nutritional food bar twice a week and a seasonal fruit (usually banana as it is the cheapest) once a week. Also, there has been a plea to extend the NP-MDMS to secondary and higher secondary school-going children (up to class XII) (Banarjee et al 2011).
5. Quality of food: Repeated incidences of food poisoning due to mid day meal are serious threat to the program existence and should be controlled by improving the quality of services. In recent times, there have been some tragic incidents with respect to this program. In the wake of these incidents, the GOI has decided to constitute a monitoring committee to look into the quality of food supplied and ensure effectiveness of the supply chain and proper hygiene. This committee is expected to supplement the efforts of the existing Mid-Day Meal monitoring committee which meets twice a year and warns the states if there are any short comings. The GOI has also asked all states to set up decentralized monitoring units, increase public awareness about the mid-day meal so that parents can keep a watch, and to set up monthly monitoring by a community committee headed by the local Member of Parliament. The Ministry has issued guidelines to all states to ensure quality, safety and hygiene under the NP-MDMS. Aside from making it mandatory for a teacher to taste the food before serving it to the school children, the GOI has asked that a member of the school management committee to be present and taste the meal. Stressing on the need for safety and hygiene, the Ministry has asked all states to use the recommended kitchen-cum store designs. These recommendations need to be ensured.
6. Monitoring: An on-line review system for the NP-MDMS has also been initiated. This web-enabled management information system with interactive voice response system will ensure that all states submit monthly reports to the GOI on time. It will also provide instant data relating to number of children covered, food grains procured, utilized, non-provision of meals in schools and irregularities, if any (Department of School Education and Literacy 2012-13).
7. Right to education: Since 1 st April 2010, the GOI has implemented the Right of Children to Free and Compulsory Education Act, 2009 (RTE Act). This Act makes education free and compulsory to all children of India in the 6-14 years age group, and has initiated steps to ensure that school children receive "quality education" (Deodhar et al 2010). It is envisioned that the proper implementation of the GOI's ICDS scheme, NP-MDMS and RTE Act in combination will result in all Indian children being well-nourished and well-educated. Eventually, these healthy and well-educated citizens will ensure a brighter future for our country (Karande et al 2014).
8. The sustainability of the scheme depends on the political will, community participation, and continuous monitoring of the program and should be ensured.

18C. NATIONAL NUTRITIONAL ANEMIA PROPHYLAXIS PROGRAM

Anemia among Children

Anemia is a serious concern for young children as it can adversely affect cognitive performance, behavioral and motor development, coordination language development and scholastic achievement as well increase morbidity from infectious deceases.

Hemoglobin levels are classified into three categories: mild (10.0-10.9 g/dl), moderate (8.0-9.9 g/dl) and severe (less than 8.0 g/dl) (Jain 2005). The proportion of anemic children of 6-35 months has risen from 74 per cent in 1998-99 to 79 per cent in 2005-06. The increases is noticed in both rural and urban areas though the increase is higher in rural than in urban areas.

The level of anemia among children of 6-35 months varies from 56% in Kerala and 59% in Himachal Pradesh, 85% in Uttar Pradesh and 88% in Bihar. The levels of anemia are also higher among rural than urban children. And the rural – urban differential has widened from 4 percentage points in 1998-99 to 8 percentage points in 2005-06. Available studies on prevalence of nutritional anemia in India show that 65% infant and toddlers, 60% 1-6 years of age, 88% adolescent girls (3.3% have hemoglobin <7 gm/dl; severe anemia) and 85% pregnant women (9.9% severe anemia) having anemia.

Anemia in Adult

The prevalence of anemia was marginally higher in lactating women as compared to pregnancy. The commonest is iron deficiency anemia (Table 18C.1).

The program was launched in 1970 to prevent nutritional anemia in mothers and children. Under this program, the expected and nursing mothers as well as acceptors of family planning are given one tablet of iron and folic acid containing 60 mg elementary iron which was raised to 100 mg elementary iron, however folic acid content remained same (0.5 mg of folic acid) and children in the age group of 1-5 years are given one tablet of iron containing 20 mg elementary iron (60 mg of ferrous sulphate and 0.1 mg of folic acid) daily for a period of 100 days.

Table 18C.1: Prevalence of Iron deficiency Anemia in India

Iron deficiency Anemia	Percentage
Children (6-35 months)	79 (NFHS-3)
6-11 months	71.7-80
12-23 months	77.7-78
24-35 months	72
<6 mon-6 yrs (<11g/dl)	70
5-11 yrs	73
Adolescent girls <12g/dl)	52-88
Mild anemia	34
Moderate anemia	15.7
Severe anemia	1.8
Adolescent girls in Urban slum of Delhi	46.6
Pregnant and Lactating women (<11g/dl)	58 (NFHS 3)
	81.7 (ICMR)
Women 15-49 years ever married	56 (NFHS 3)
Adult Male (<13g/dl)	24 (NFHS 3)

Source: NFHS 3, ICMR 2004

According to new directives from Ministry of Health & family Welfare, the following recommendations (Govt. of India 2007) are given:

1. The infant between 6-12 months should also be included in the program as there is sufficient evidence that iron deficiency affects this age group also.
2. Children between 6 months to 60 months should be given 20 mg elemental iron and 100 microgram folic acid per day per child as this regimen is considered safe and effective.
3. National IMNCI guidelines for this supplementation to be followed.
4. For children (6-60 months), ferrous sulphate and folic acid should be provided in a liquid formulation containing 20 mg elemental iron and 100 microgram folic acid per ml of the liquid formulation. For safety reason, the liquid formulation should be dispatched in bottles so designed that only 1 ml can be dispensed each time.
5. Dispersible tablets have an advantage over liquid formulation in programmatic conditions. These have

been used effectively in other parts of the world and in large scale Indian studies. The logistics of introducing dispersible formulation of iron and folic acid should be expedited under the program.

6. The current program recommendations for pregnant and lactating women should be continued.
7. School children, 6-10 years old and adolescents 11-18 years old, should also be included in the National Nutrition Anemia Prophylaxis Program (NNAPP).
8. Children 6 months to 5 years the iron supplement in liquid formulation dose is 20 mg elemental iron and 100 microgram folic acid per day for 100 days and 6-10 year old will be provided 30 mg elemental iron and 250 microgram folic acid per child per day for 100 days in a year.
9. Adolescent 11-19 years will be supplemented at the same doses and duration as adults. The adolescent girls will be given priority.
10. Multiple Channels and strategies are required to address the problem of Iron deficiency anemia. The newer products such as double fortified salts/ sprinklers/ ultra- rice and other micronutrient candidates or fortified candidates should be explored as an adjunct or alternate supplementation strategy.

This program is being taken up by Maternal and Child Health (MCH) Division of Ministry of Health and Family Welfare. Now it is a part of RCH Program. But this program has failed to make any impact in India. Experiences from other countries in controlling moderately-severe anemia have suggested that long term measures such as fortification of food items like milk, cereal, sugar and salt with iron are beneficial interventions. India has also identified fortification of salt with iron as a useful measure to control anemia. Pilot project of salt fortification with iron has been started in Tamil Nadu. Nutrition education to improve dietary intakes in family for receiving needed macro/ micro nutrients as protein, iron and vitamins like folic acid, B_{12}, C, etc. for hemoglobin synthesis is important. Nutritional Anemia Control Program should be comprehensive and incorporate nutrition education through school health and ICDS infrastructure to promote regular intake of iron/folic acid-rich foods, to promote intake of food which helps in absorption of iron and folic acid and adequate intake of food.

COMMENTS

One of the studies it was found that women taking iron supplements during pregnancy were more likely to develop high blood pressure and to have a baby that was small for its gestation age. The study highlights the need of proper advise of diet and nutrition on detecting anemic status of mother rather than giving indiscriminate iron and vitamin tablets to them (Steer P et al. 2007). Iron supplementation can be risky for children living with high malarial areas and can lead to severe illness and death (Teilsch JM et al 2006). As India has many high malarial states where prophylactic iron may be risky. An alternative policy is required in such areas. According to another research study conducted in Teheran revealed that the expectant mothers should not unnecessarily be given iron ills unless anemic, as it may cause development of high blood pressure and hence small gestation age babies (International J Obs & Gynec 2007).

Following strategies should be tried:

- Use traditional food processing techniques to increase bioavailability of iron
- Improve dietary behavior thru nutr'n education
- Consume iron-fortified processed complementary foods
- Supplement infants and young children (iron syrup, micronutrient powders added to complementary foods)
- Combinations of the above strategies

12-by-12 INITIATIVE FOR ANEMIA CONTROL

A 12-by-12 initiative was launched at AIIMS on April 24, 2007 with a view to ensure that every child should have hemoglobin of 12 grams by the age of 12. This initiative is jointly taken by Ministry of Health & Family Welfare, Govt. of India; WHO; FOGSI (The Federation of Obstetrics and Gynecology Societies of India) and UNICEF along with other partners.

The objective of the program is to ensure that every child by the age of 12 years has a healthy hemoglobin level. Awareness and correction of iron deficiency anemia during adolescence will go a long way in improving the health of the future parents. The initiative

for controlling adolescent anemia is an effective and sustainable nation-building exercise. It will result in far-reaching benefits in terms of safe motherhood and healthier future generations.

All the partner agencies will work in their areas like adoption of a few schools and creating public awareness by giving advice on dietary pattern. Workshops will be conducted in rural and slum areas. Children between the age group of 10-14 will be screened and if the haemoglobin levels are found to be below 12 grams, iron supplements will be given. In 'adopted' schools, an Iron Day has been declared where students will be educated about the issue and their dietary pattern will be corrected. The 12 by 12 initiative program focuses on increasing iron intake of children, controlling worm infestations and other infections and improving overall nutritional status by changing the dietary pattern in such a way as to make iron more bio-available.

National Iron Plus Initiative

One of the goals for the 12th Five Year Plan is to reduce anemia in girls and women by 50 per cent. This initiative will bring together existing programs (IFA supplementation for: pregnant and lactating women and; children in the age group of 6–60 months) and introduce new age groups.

Under National Iron+ Initiative, the following age groups are covered for lifelong supplementation of Iron from the age of 6 month onwards:

1. Bi-weekly 20 mg elemental iron and 100 microgram (mcg) folic acid per ml of liquid formulation and age appropriate de-worming for preschool children of 6-59 months.
2. Weekly supplementation of 45 mg elemental iron and 400 mcg folic acid per child per day for children from 1st to 5th grade in Govt. & Govt. Aided schools, and at AWC for out of school children (6 to 10 years).
3. Weekly dose of 100 mg elemental iron and 500 mcg folic acid with biannual de-worming in adolescents (10–19 years) under WIFS
4. Weekly supplementation for women in reproductive age, Pregnant and lactating women.

Supplementation for Children 6–60 months as per GoI guidelines

One ml of IFA syrup containing 20 mg of elemental iron and 100 mcg of folic acid biweekly for 100 doses in a year. Iron folic acid supplements be supplied in bottles of 100 ml each. IFA supplement will be administered under the direct supervision of ANM/ ASHA on fixed days on a biweekly basis. The micro plan for reaching out to these children can be worked out at village level. It is recommended that a particular child should receive the supplement on the fixed day (Monday and Thursday). The nutritional status of children should be assessed by MUAC (Mid Upper Arm Circumference less than 11.5 cm) to ensure that IFA syrup is not given to children with Severe Acute Malnutrition (SAM). Prophylaxis with iron should be withheld in case of acute illness (fever, acute diarrhoea, pneumonia etc.), Severe Acute Malnutrition (SAM) and in a known case of haemoglobinopathy/ history of repeated blood transfusion.

Age groups	No Anaemia	Mild	Moderate	Severe
Children 6–59 months of age	≥11	10–10.9	7–9.9	<7
Children 5–11 years of age	≥11.5	11–11.4	8–10.9	<8
Children 12–14 years of age	≥12	11–11.9	8–10.9	<8
Non-pregnant women (15 years of age and above)	≥12	11–11.9	8–10.9	<8
Pregnant women	≥11	10–10.9	7–9.9	<7
Men	≥13	11–12.9	8–10.9	<8

Source: Haemoglobin concentration for the diagnosis of anaemia and assessment of severity. WHO

Age group	Intervention/Dose	Regime	Service delivery
6–60 months	1ml of IFA syrup containing 20 mg of elemental iron and 100 mcg of folic acid	Biweekly throughout the period 6–60 months of age and de-worming for children 12 months and above.	Through ASHA Inclusion in MCP card
5–10 years	Tablets of 45 mg elemental iron and 400 mcg of folic acid	Weekly throughout the period 5–10 years of age and biannual de-worming	In school through teachers and for out-of-school children through Anganwadi centre (AWC) Mobilization by ASHA
10–19 years	100 mg elemental iron and 500 mcg of folic acid	Weekly throughout the period 10–19 years of age and biannual de-worming	In school through teachers and for those out-of-school through AWC Mobilization by ASHA
Pregnant and lactating women	100 mg elemental iron and 500 mcg of folic acid	1 tablet daily for 100 days, starting after the first trimester, at 14–16 weeks of gestation. To be repeated for 100 days post-partum.	ANC/ ANM /ASHA Inclusion in MCP card
Women in reproductive age (WRA) group	100 mg elemental iron and 500 mcg of folic acid	Weekly throughout the reproductive period	Through ASHA during house visit for contraceptive distribution

IFA tablet has been made blue (*'Iron ki nili goli'*) to distinguish it from the red IFA tablet for pregnant and lactating women.

18D. NATIONAL PROGRAM FOR PROPHYLAXIS AGAINST BLINDNESS IN CHILDREN CAUSED DUE TO VITAMIN-A DEFICIENCY

A survey in five states (Assam, Bihar, Orissa, West Bengal and Tripura) showed the prevalence of Bitot's spots to be 0.7-2.2 percent and of night blindness to be 1.2-4.0 percent, indicating a public health problem in all five states (Chakravarty 2000). The survey also showed high prevalence of night blindness among pregnant women (3.2-16 percent). A survey of the Indian Council of Medical Research in 1988, covering sixteen districts mostly in northern and eastern regions, showed that prevalence of Bitot's spots ranged from 0 to 4.7% and that of night blindness from 0.4 to 4.8 %(Toteja 2002). Severe deficiency, causing corneal xerophthalmia or keratomalacia and eventual blindness in children, is uncommon (Bhatacharya 1986, NNMB 1991). This prevalence is still above 0.5 percent, which is the WHO cut off level for a public health problem. Massive administration of massive doses of vitamin A is advocated on the grounds that this could bring about a controversial 23 % reduction in mortality (Gopalan 1986; Vijayraghavan et al 1990).

Under the ***National Program for Prophylaxis against Blindness in Children caused due to Vit. A deficiency*** every child has been provided prophylaxis against vit-A deficiency in the form of oral 5 doses starting at 9 months with measles as a first dose (1 Lac IU) then at 15 months a second dose (2 Lac IU),

then every 6 monthly (2 Lac IU) till the age of 3 years. These doses are administered by Anganwadi workers under the supervision of ANM. The program has been implemented through RCH program. The 10th five year plan has set the goal of eliminate vitamin A deficiency as a public health problem and decreasing prevalence of night blindness below 1% and bitot spots to below 0.5% in children (6 months -6 years).

The program suffered a setback due to Assam episode that resulted in death after the consumption of Vitamin A by a year old child from a tea community (TOI 2001). This triggered panic among the parents. Thousands of people rushed with their children to the nearest Health Centre, some of them complaining of fever, vomiting and diarrhoea (Solomons 2004). Similarly a report of 17 kids fall ill after consuming vitamin A syrup (HT 2005) Normally, these symptoms do not attract mass attention, but the media sensationalized the event in Assam leading to a wave of mass concern. All deaths and illnesses that occurred in children during the following week were attributed to vitamin A. There is no evidence that vitamin A causes death, even if a child had received twice the recommended amount (400,000 IU).

This is the dose recommended by the WHO for treatment of xerophthalmia. The vitamin A program has been in operation for the past several years in India and in sixty other countries. So far, not a single case of death attributable to vitamin A dosing was reported. The lethal dose of vitamin A is not known, but a review of the case reports of children getting 300,000 – 900,000 IU do not suggest severe toxic effects that could be fatal (Sommer 1996). However, it is stated by few researchers that the mega-dose of vitamin A (200 000 IU) given to children is 500 times higher than the daily recommended dose (400 IU). After administration of mega-doses of vitamin A to young children, signs of intra-cranial tension showing as bulging of the anterior fontanels are evident in up to 16 % of all cases (de Francisco 1993, Gopalan et al 2003). The first twelve months of life are crucial for brain development. This is the time when billions of brain cells are multiplying and establishing thousands of inter-neuronal synaptic connections. Adverse effects of high doses of vitamin A on bone resorption and bone formation have been demonstrated in animals.

The meta-analyses whose results evidently support the claim has also been questioned (Gopalan 1993; Humphrey & Rice 2000). By contrast, a recent meta-analysis of all the Indian studies shows that the findings from vitamin A trials are inconsistent (Gupta 2002). The most recent findings are from the largest ever randomized controlled De-worming and Enhanced Vitamin A (DEVTA) trial, in which one million rural children in the state of Uttar Pradesh in north India were included. Half the children were given vitamin A supplements and half were not. There was no significant difference in the death rates between children who received the massive dose of vitamin A and those who did not (Awasthi 2008).

Keeping above facts in mind the universal large dose of Vit A should not be given except in communities where acute clinical deficiency of vitamin A is common. The focus should be on food-based approach i.e., giving green leafy vegetables, and many fruits and other plant foods, are also good sources of folate, vitamin C, Fe, Ca and many other micronutrients and bioactive compounds which is the economical, effective and sustainable way (Kapil 2009).

The recent recommendations from the expert groups/ committees for selecting the eligible children for vitamin A supplementation were unanimously endorsed (ICMR 2003). These recommendations state: (*a*) Under the vitamin A supplementation program, children between 9 months to 36 months of age are to be provided Vitamin A solution every six months starting with 100,000 IU at 9 months age with measles vaccination, and subsequently 200,000 IU every six months till 36 months of age; (*b*) Children with a clinical diagnosis of severe protein energy malnutrition (visible severe wasting or edema both feet) should be given an additional dose of 100,000 IU vitamin A solution at the time of diagnosis, if the child has not received a mega dose of vitamin A in the preceding four weeks; (*c*) In severely malnourished children (weight for age below -3 SD) above 3 years of age, a single dose of vitamin A (200,000 IU) is to be given at the time of diagnosis by a physician, if the child has not received a mega dose of vitamin A in the preceding four weeks; (*d*) Children with measles should be given an additional dose of vitamin A at the time of contact as per their age and nutritional status, if the child has not received a mega dose of vitamin A in the preceding

four weeks as outlined above (100,000 IU below 12 months age or in severely malnourished children below 36 months of age, and 200,000 IU for others).

VITAMIN AND MINERAL DEFICIENCY

Micronutrient Initiative has issued a report on Global Vitamin & Mineral Deficiency that presented following findings:

1. Iodine deficiency is estimated to have lowered the intellectual capacity of almost all of the nations reviewed by as much as 10 to 15 percentage point.
2. Iron deficiency in the 6-to-24 month age group is impairing the mental development of 40% to 60% of the developing world's children.
3. Severe iron deficiency anemia is causing the deaths of an estimated 50,000 young women a year in pregnancy and childbirth.
4. Iron deficiency in adults is so widespread that it is lowering the energies of nations and the productivity of workforces-with estimated losses of up to 2% of GDP in the worst affected countries. Vitamin and mineral deficiencies impose high economic costs on virtually every developing nation.
5. Vitamin A deficiency is compromising the immune systems of approximately 40% of the developing world's under-fives and leading to the early deaths of an estimated one million young children each year.
6. Iodine deficiency in pregnancy is causing as many as 20 million babies a year to be born mentally impaired.
7. Folate deficiency is causing approximately 200,000 severe birth defects every year and is associated with approximately 1 in every 10 adults deaths from heart disease.
8. In practice, vitamin and mineral deficiencies overlap and interact. Half of children with VMD are suffering from multiple deficiencies-adding up an immeasurable burden on individuals, on health services, on education systems, and on millions of families caring for children who are disabled or mentally impaired.

Targets

The UN has called for the elimination of iodine deficiency by 2005; the elimination of vitamin A deficiency by 2010; and a reduction of at least 30% in the global prevalence of iron deficiency anemia by 2010.

Solutions

1. Fortification: adding essential vitamins and minerals to foods that are regularly consumed by a significant proportion of the population (such as flour, salt, sugar, cooking oil). The cost can be as little as a few cents per person per year.
2. Supplementation: reaching out to vulnerable groups (particularly children and women of childbearing age) with vitamin and mineral supplements in the form of tablets, capsules and syrups costing only a few cents per person per year.
3. Education: Informing communities about the kinds of foods that can increase the intake and absorption of vitamins and minerals.
4. Disease control: controlling diseases like malaria, measles, diarrhea, and parasitic infections can also help the body to absorb and retain essential vitamins and minerals.

Challenges for 2004-10

The major challenges are:

1. Sustaining recent achievements.
2. Building a new awareness.
3. Meeting the iron challenge.
4. Forming national alliances to plan, implement and monitor specific national solutions.
5. Partnering the food industry so fortified food products can be distributed.
6. Development of science and technology.
7. Monitoring progress.

Table 18D.1: Proportion of Vitamin Mineral Deficiency

	India	Bangladesh	Pak	China	Nepal
Anemia <5 yr	75	55	56	8	65
Anemia Women	51	36	59	21	62
Goiter Rate	26	18	38	10	24
Salt iodized	50	70	17	93	63

(Source: Micronutrient Initiative)

PILOT PROJECT AGAINST MICRONUTRIENT MALNUTRITION

Micronutrient malnutrition is a global public health problem (Agrawal 2005). The National Family Health Survey (NFHS) III data reveals a dismal picture of malnutrition, especially micronutrient malnutrition in children. The percentage of children under 3 years who are underweight is 45.9 %, who are stunted is 38.4% and who are wasted is 19.1%. There is problem of iodine, iron, zinc, and fluorine deficiency leading to many clinical manifestations in the population. The pilot project against micronutrient malnutrition was started in the year 1995 in Assam along with four other states- Bihar, Orissa, West Bengal and Gujarat. This project has been merged with NIDDCP.

Objectives

1. To assess the magnitude of fluorosis and dental caries beside assessing the iron and Vitamin-A deficiency in the project area;
2. To assess and improve iron and vitamin-A status in school going children, adolescent boys and girls, nonpregnant women, adult males and geriatric population;
3. To launch extensive information, education and communication strategy through mass media to improve the dietary habits of the population;
4. To study zinc level in various food products and soil; and
5. To coordinate with similar ongoing program being implemented in the country.

All India Institute of Hygiene and Public Health (AIIH&PH), Kolkata is implementing the program. The program is being implemented in one district of 5 selected states covering 1% of the population of the districts. Baseline survey has been conducted in Assam and training of workers was also organized.

COMMENTS

Zinc is an essential micronutrient and plays an essential role in growth, immune functions, and resistance to infections in children. Association of maternal zinc deficiency with adverse pregnancy outcome is debated. There is strong evidence to support the role of zinc supplementation in diarrhea morbidity and mortality reduction (Sazawal 1995). Similarly it is also associated with cough and acute respiratory infection and malaria (Sazawal 1998). For these reasons zinc supplementation is important for child survival. Incorporation of zinc supplements in treatment schedules of diarrhea and pneumonia should be planned. Community based supplementation should be undertaken in areas with multiple micronutrient deficiency in high child mortality areas. Research to map-out prevalence of zinc deficiency and other coexisting micronutrient deficiency and study of micronutrient interactions should be encouraged further.

International Zinc Nutrition Consultative Group Technical Document-2 Systematic reviews of zinc intervention strategies

Current evidence indicates that preventive zinc supplementation reduces the incidence of diarrhea by approximately 27% among young children greater than 12 months of age and decreases the incidence of acute lower respiratory tract infections by approximately 15% (Brown 2009). Overall, zinc supplementation reduces child mortality by approximately 6%. However, this impact of preventive zinc supplementation on child mortality is restricted to children more than 12 months of age (in whom the mortality reduction is approximately 18%), and possibly to small-for-gestational-age infants. Preventive zinc supplementation also increases linear growth and weight gain of young children, thereby contributing to reduced rates of stunting and underweight. Importantly, available studies show that preventive zinc supplements provided in recommended amounts do not have adverse effects on the status of other micronutrients or cause any detectable functional abnormalities. Thus, the recommended doses of preventive zinc supplementation are both safe and beneficial for child health and physical growth.

Preventive zinc supplementation has also been examined among pregnant and lactating women (Hess 2009). An earlier meta-analysis concluded that zinc supplementation during pregnancy reduced the rate of preterm births by 14% (Mahomed 2007). Most studies found no significant impact of maternal zinc supplementation on infant birthweight, but a subset of studies conducted in underweight or zinc-deficient women suggests that there may be a positive effect of zinc supplementation in such women. However, the number of relevant studies is limited, and more

information is needed to confirm these observations. The impact of maternal zinc supplementation during pregnancy on infant postnatal growth and risk of infection is variable, and few studies are available. Thus, more research will be needed to allow definitive conclusions to be drawn, especially for the second half of infancy and later childhood.

Studies using multiple different food vehicles have demonstrated a positive effect of zinc fortification on total zinc absorption, but only a few studies have confirmed a positive impact of zinc fortification on serum zinc concentrations or functional indicators of zinc status (Hess 2009), possibly because the level or duration of fortification was inadequate or the study populations were not initially zinc deficient. Nevertheless, because of the presumed benefits of increasing zinc intake in populations at high risk for zinc deficiency, the documented increase in total zinc absorption that occurs following zinc fortification, the absence of any adverse effects, and the relatively low cost of adding zinc, public health planners should consider including zinc in mass and targeted fortification programs in such populations. Because of the limited available information on program impact, it will be important to continue to evaluate the outcomes of such programs in the future.

Fortifications

Several international studies have reported that among the various strategies to prevent malnutrition, food fortification has been proved to be socially acceptable, requires no change in food habits and is the most cost effective way of reaching large target populations that are at risk of micronutrient deficiency.

Salt is consumed by all segments of the population. It is inexpensive and therefore one of the most suitable vehicles for fortification if the micronutrient deficiency is wide spread. In India about 70-90% of the population is estimated to be iron deficient and majority of the population are anemic. Under these conditions salt fortification with iron (in addition to the mandatory fortification with iodine) is one of the feasible methods for combating iron deficiency anemia.

There are several technologies available for iron and iodine fortification. The one developed by National Institute of Nutrition (NIN) has been widely tested and has been approved by PFA. It is acceptable and affordable.

Chattisgarh has been providing Double Fortified salt (DFS) at subsidized cost through PDS (Public Distribution System). Himachal Pradesh has been providing DFS to the ICDS beneficiaries. Mid Day meal (MDM) guidelines suggest use of DFS for MDM. However, the supply constraints have come in the way of its wider use. Fortification in foods for large scale feeding programs such as Integrated Child Development Services (ICDS) and Mid day Meal (MDM) Scheme in India has been initiated in the State of Gujarat via fortified wheat flour, nutri-candy, use of oil fortified with Vitamin A and D and iodized salt.

Problems with fortifications: However, food fortification is sometimes opposed for professional reasons (concern about overdoses) or on human rights grounds (consumers should be informed about the fortification, or should have a choice of a fortified or non-fortified food).

According to Dr Kamala Krishnaswamy, former director NIN Hyderabad - DFS developed by NIN will provide only 1 mg/gram of salt and with low iron absorption; it will take a long time to demonstrate a rise in Hemoglobin. Over a period of time (2-5 years), the Hemoglobin curve is likely to shift to the right (Solution exchange). It should be remembered that more salt intake is also associated with hypertension.

There have been several reviews of multiple micronutrient fortification in Atta (Wheat Four) and several constraints in use of this have been identified. The fact that more than half the country is rice eaters will also have to be taken into account. For a country like India where people are largely rural based, like to consume fresh foods and have such varied dietary habits, fortification of foods is not one of the best options excepting in some special cases.

Fortifying multiple products with multiple nutrients may result in some segments of the population who may not have the deficiencies getting more than the requirements; it will also inevitably push up the cost of the product. All these have to be considered while deciding what product is to be fortified with what micronutrient.

Economy of Fortification

The case for micro-nutrient fortification of food for pre-school and school children is a strong one. Even in purely economic terms, studies have revealed that the benefits of investments in micronutrient fortification far outweigh the costs. Horton S makes very rough estimates of the annual potential costs attributable to iodine deficiency in the developing world - $35.7 billion prior to widespread salt iodization, as compared with an estimated $ 0.5 billion annual cost for salt iodization, i.e., a 70:1 benefit : cost ratio. A more detailed incidence study for iron fortification (Horton and Ross) estimates that the benefit : cost ratio has a median value of 6:1 for effects on physical productivity, which rises to 36:1 if cognitive benefits are also included. The nutrients most relevant for developing countries are iodine, iron, and vitamin A, with newly emerging concern- zinc (for diarrhea prevention).

Home fortification with sprinkles which may contain iron, zinc, iodine, vitamins A, C, and D, and folic acid has also been used to target weaning-age children. The unit costs tend to be higher than for commercial fortification, but the intervention can be targeted to weaning-age children who are particularly vulnerable to deficiency and who are unlikely to obtain enough of selected micronutrients from foods fortified for the general population.

Estimates for Sprinkles for Pakistan, when primarily targeted to children 6–12 months, suggest that cost per disability adjusted life year (DALY) saved could be as low as $12 (based on the effects of zinc on averting diarrhea), and the benefit : cost could be 37:1 (based on the effects of iron on future productivity due to cognitive benefits), which are quite similar to estimates for commercial fortification. These estimates are based on intervention trials rather than a full-scale program, but could be useful as similar conditions prevail in India.

According to Horton, in regions where rice is the preferred staple, bio-fortification may be considered, whereby higher micronutrient density is either bred, or introduced via genetic modification, into staple food crops. Bio-fortification of rice is of particular interest because it is more difficult and costly to fortify rice by conventional means than the other grains. Preliminary work suggests this could be very cost effective. For rice, high iron varieties have been identified and feeding trials have shown the iron to be bio-available and to lead to higher body iron levels. Golden rice genetically modified to contain a high beta carotene content aims at providing the recommended daily allowance of vitamin A (in the form of beta carotene) per 100-200 grams of rice, which is the daily rice consumption of children in rice eating countries, including India.

(Based on Horton and Solution exchange discussion)

Nutritional Rehabilitation Center

Nutritional Rehabilitation Center is a unit in a district health facility where children with Severe Acute Malnutrition (SAM) with significant medical needs are enrolled residentially as per the defined admission criteria and provided with medical and nutritional therapeutic care. In addition to curative care special focus is given on timely, adequate and appropriate feeding for children; and on improving the skills of mothers and care givers on complete age appropriate caring and feeding practices. In addition, efforts are made to build the capacity of mothers/care givers through counseling and support to identify the nutrition and health problems in their child. In response, Government of Gujarat launched "Mission Balam Sukham" in the year 2012 which focuses on both preventive and curative aspects. In other states it is working with different names. The some success of weight gain has been recorded. However success of this program is based grass root level link workers like ASHA/ AWW who has to refer the cases to these centers. These workers should be trained and motivated for this activity also. A follow up system at home for rehabilitated children should be set up for where promotive and preventive rather than curative action can be instituted. It is also suggested that mobile Nutritional Rehabilitation center (NRC) should be started to reach out to missed cases (Bhamani NR et al 2015).

18E. WORLD FOOD PROGRAM (WFP)

World Food Program is the world's largest international food aid organization, serving in 80 countries working with the goal of achieving "A world in which every man, woman and child has access at all times to the food needed for an active and healthy life. Without food, there can be no sustainable peace, no democracy and no development". Founded in 1963 as the food aid arm of the United Nation after the Rome Declaration on World Food Security in 1996, WFP is committed to achieve the goal of reducing half the number who are without adequate access to food by 2015. The world has made real progress by reducing the number of people suffering from hunger by 200 million since the 1990s. Yet there are still 795 million people who do not receive enough food for an active healthy life. The Innovation Accelerator should be a key way to help reach Sustainable Development Goal 2 and end hunger by 2030.

World Food Program in India

An estimated 21.25 percent of the Indian population live on less than US$1.90 per day. The country is home to one-quarter of all undernourished people worldwide. Any global impact on hunger requires progress in food and nutrition security in India. India ranks 130th out of 188 countries in the 2015 UNDP Human Development Index and 80 out of 104 countries in the Global Hunger Index. While per capita income in India has more than tripled in the last two decades, the minimum dietary intake fell during the same period. Levels of inequality and social exclusion are very high. The bottom 10 percent of the population accounts for only 3.6 percent of the total consumption expenditure and the top 10 percent accounts for 31 percent - the gap between rich and poor has increased during the period of high economic growth.

Food delivery was phased out in 2012 and under a new Country Strategic Plan 2015-18, WFP is supporting the Government in strengthening the efficiency and effectiveness of its food-based safety nets under the National Food Security Act (NFSA). This includes the Targeted Public Distribution System (TPDS); the Integrated Child Development Service (ICDS) targeting mothers and young children; and the Mid-Day-Meal (MDM) school feeding programme. WFP is also committed to enhancing the capacity of Government on food security analysis and benchmarking of NFSA schemes for effective results.

WFP India works to improve the efficiency, accountability and transparency of ***Targeted Public Distribution System (TPDS)*** to ensure it reaches those who need it most. WFP supports the Government with reforms aimed at improving targeting of beneficiaries and supports better alignment with Fair Price Shop operations. In consultation with the Government, national and international experts, WFP led development of a design and implementation plan to strengthen TPDS at the State level.

WFP is ***fortifying foods*** served to school children via the national Midday Meal (MDM) school feeding programme. In a pilot project, rice fortified with iron was used in school meals in the Gajapati district of Odisha State. The rate of anemia dropped by about 20 percentage points of which six percentage points were attributable to the fortified rice in the meals.

WFP is working in Odisha on institutionalizing food security analysis and vulnerability ***mapping*** within the government systems in the context of achieving Zero Hunger and the United Nations' Sustainable Development Goal #2.

Recent Cochrane and BMJ reviews have found that school feeding programs in disadvantaged children significantly improve school attendance levels and the growth and cognitive performance of disadvantaged children. Currently, school feeding programs (either as a breakfast or lunch) are being implemented worldwide in 169 countries (both in developing and affluent countries), and up to 368 million children are being fed daily; with up to US$75 billion invested each year. Unfortunately, in low-income countries, where the need is greatest, the overall average coverage is the lowest (18%); and in lower-middle-income countries it is 49% with India at 79%. School-feeding programs achieve much more than just feeding children. They contribute to a child's readiness to learn

and ability to participate in his or her own educational process, and the benefits are particularly strong for girls. Along with "quality education", it promotes human capital development in the long run and helps break inter-generational cycles of poverty and hunger (Karande et al 2014).

References

Afridi F. Midday Meals in Two states: Comparing the financial and institutional organization of the program. Economic and Political Weekly 2005; XL (15): 1528-1535.

Agarwal AK. Zinc deficiency: Public health perspective. Ind J Com Med 2005; 30 (3) 73-74.

Agarwal KN. Assessment of Prevalence of Anemia and Iron stores in response to daily/weekly iron folate (10-18yrs) from urban slum of North East Delhi. Unicef 95/0075, 1998; pp-9.

Awasthi S, Peto R, Read S & Bundy D (2007) Six-monthly vitamin A from 1 to 6 years of age. DEVTA: cluster-randomised trial in 1 million children in North India . http://www.ctsu.ox.ac.uk/projects/devta/resolveuid/081055e104b96b5203fc2c8da5091096 (accessed May 2008).

Banerjee S, Dias A, Shinkre R, Patel V. Under-nutrition among adolescents: A survey in five secondary schools in rural Goa. Natl Med J India 2011;24:8-11

Bhimani NR, Vachhani PV, Kartha GP. A study to evaluate the effects of nutritional intervention measures on children admitted in the nutritional rehabilitation center (Bal Sanjeevani Kendra) of Surendranagar district. Int J Res Med Sci 2015;3(8):1989-93.

Bhattacharya AK & Chatopadhyaya PS (1986) Xerophthal-mia in West Bengal, India. Bull Calcutta Sch Trop Med 34, 4447.

Brahmam SNV. National Nutrition Monitoring Bureau. Ind J Com Med 2007; 32 (1)7-9.

BSN Rao. Prevention and control of Anemia in India. Theory and Practices. Bulletin Nutrition Foundation of India 1991, 12: 4-8.

Brown K Dewey K Allen L. Complementary feeding of young children in developing countries: A review of the literature. World Health Organization 1998.

Brown KH, Peerson JM, Baker SK, Hess SY. Preventive zinc supplementation among infants, preschoolers, and older prepubertal children. Food Nutr Bull 2009;30:S12-40.

Bruce N, Perrez-Padilla R, Albalak R. Indoor air population in developing countries: A major environment and public health challenge. Bulletin of the World Health Organization 2000; 78-1078-92.

Butz WP, Habicht JP, DaVanzo J. Environmental factors in the relationship between breastfeeding and infant mortality: the role of sanitation and water in Malaysia. American journal of Epidemiology 1984; 119:516-25.

Chopra M, Galbraidth S, Darnton- Hill I. A global response to a global problem: the epidemic of overnutrition. Bulletin of the World Health Organization 2003; 80:952-8.

Chakravarty, I., Ghosh, K. Micronutrient Malnutrition - Present Status and Future Remedies. J. Ind. Med. Assoc. 2000; 98: 539.

Davey A, et al. Perception regarding quality of services in urban ICDS blocks in Delhi. Ind J Public Health 2008; 52 (3): 156-158.

de Francisco A, Chakraborty J, Chowdhury HR, Yunus M, Baqui AH, Siddique AK & Sack RB. Acute toxicity of vitamin A given with vaccines in infancy. Lancet 1993; 342, 526–527.

Department of School Education and Literacy and Department of Higher Education. Ministry of Human Resource Development, Government of India. Annual Report 2012-13.Available from: http://www.mhrd.gov.in/sites/upload_files/mhrd/files/AR_2012-13.pdf. [Last accessed on 2014 Mar 29].

Deodhar SY, Mahandiratta S, Ramani KV, Mavalankar D, Ghosh S, Braganza V. An evaluation of mid day meal scheme. Journal of Indian School of Political Economy 2010;22:33-48

Dreze J, Goyal A. Future of midday meals. Economic and Political Weekly 2003; Nov 4673-83.

EPW. Child Malnutrition: Behind numbers. Economic and Political Weekly 2006; XLI (18):1732.

Esrey SA 1996. Water, waste, and well-being; A multi-countries study. American journal of Epidemiology 1996; 143:608-23.

Gillespie S, McLachian M, Shrimpton R. Combating malnutrition. Time to act Washington, DC, the World Bank Group 2003.

Gopalan C & Tamber B (2003) Food-based approaches to prevent and control micronutrient malnutrition: scientific evidence and policy implications. World Rev Nutr Diet 91, 76–131.

Gopalan C (1986) Reviews and comments: Control of vitamin A deficiency – priorities for future research in India . NFI Bull, p 8.

Gopalan C (1993) Efficacy of mega dose of vitamin A: the Sudan–Harvard study. NFI Bull, pp 4–5.

Govt of India. The 10th Five Year Plan Document (2002-2007). Planning Commission, GOI, New Delhi.

Govt. of India. Annual Report 2004-2005. Min of H & FW, Nirman Bhawan, GOI, New Delhi

Govt. of India. Annual Report 2006-2007. Min of H & FW, Nirman Bhawan, GOI, New Delhi.

Govt. of India. National Nutrition Policy. GOI, New Delhi, 1993

Govt. of India. Integrated Child Development Service. Dept. WCD. Min HRD, GOI New Delhi

Govt. of India. Ministry of Health & Family Welfare New Delhi Order No. Z 28020/50/2003-CH dated 23rd April 2007.

Govt. of India. revised Nutritional and Feeding Norms for Supplementary Nutrition in ICDS scheme. Ministry of Women and Child development. Govt. of India 2009.

Gupta P & Indrayan A. Effect of vitamin A sup-plementation on childhood morbidity and mortality: critical review of Indian studies. Indian Pediatr 2002; 39, 1099–1118.

Hess SY and Brown KH, (guest editors) International Zinc Nutrition Consultative Group Technical Document #2: Systematic reviews of zinc intervention strategies. Food and Nutrition Bulletin, Volume 30, Number 1: S3-S186, 2009.

Hess SY, King JC. Effects of maternal zinc supplementation on pregnancy and lactation outcomes. Food Nutr Bull 2009;30:S60-78.

Hess SY, Brown KH. Impact of zinc fortification on zinc nutrition. Food Nutr Bull 2009;30:S79-107.

http://wcd.nic.in/sites/default/files/1-SABLAscheme_0.pdf

Horton S, The Economics of Food Fortification accessed at http://jn.nutrition.org/cgi/content/full/136/4/1068

HT Correspondent. 17 kids fall ill after consuming vitamin A syrup. Hindustan Times, Jaipur Edition, July 28, 2005, p 3.

HumphreyJH & Rice AL (2000) Vitamin A supplementation of young infants. Lancet 356, 422–424.

Jain NB, Laden F, Guller U, et al. Relation between Blood Lead Levels and Childhood Anemia in India. American Journal of Epidemiology 2005 161(10):968-973;

James P. P Ending malnutrition by 2020: An agenda for change in the millennium. Food and Nutrition Bulletin Supplement August 2001.

ICMR. Report of District Nutrition Project. Indian Council of Medical Research. 1999.

ICMR. National Workshop on Micronutrients, 24-25 November 2003, New Delhi. Organized by Indian Council of Medical Research on Behalf of Ministry of Health and Family Welfare.

India Times News. 13 November, 2001.

Karande S, Gogtay N J. Impact of the mid-day meal scheme in India. J Postgrad Med [serial online] 2014 [cited 2014 May 13];60:113-5. Available from: http://www.jpgmonline.com/text.asp?2014/60/2/113/132302

Kapur D et al. Nutritional anemia and its control. Ind J Pediatric 2002; 69(7):607-616.

Kapil U, et al. Integrated child development services (ICDS) scheme: A program for Holistic Development of Children in India. Ind J Pediatrics 2002; 69 (7):597-601.

Kapil U, et. al. ICDS Scheme-A Program for Maternal health and child development. Ind J Public Health 1997; 93-99.

Kapil U. Public Health Nutrition: 12(2), 285–286, 2009

Kishore J. Globalization and its impact on Dalit's Health. Samtawadi Bharat 2005; 2(3-4): 37-40.

Lehman K, Krebs A Control of the world's food supply. In: Mander J, Gold smith E. eds. The case against the global economy. San Francisco, CA, Sierra Club Books 1996.

Measham AR, Chatterjee M. Wasting away: the crisis of malnutrition in India. World Bank, Washington DC 1999.

Mahomed K, Bhutta Z, Middleton P. Zinc supplementation for improving pregnancy and infant outcome. Cochrane Database Syst Rev 2007:CD000230.

Naandi Foundation. Hungama report 2011. Naandi Foundation: Trendset Towers Road 2, Banjara Hills Hyderabad 500 034

Nutrition Foundation of India. A Report of the Workshop on "Mid-Day Meal Programs in Schools in India-The Way Forward". July31 -August 1, 2003, New Delhi.

NIN. Effects of Anemia and iron supplementation of Pregnancy Outcome. Ann. Report NIN 1997-98; 17.

National Nutrition Monitoring Bureau (1991) Report of Repeat Survey (1989–1990). Hyderabad : National Institute of Nutrition.

Micronutrient Initiative. Fighting the hidden hunger. Ottawa, MI Publications 1998.

Mukul A. Caste, gender bias cases mar mid-day meal plan. TOI 5th August 2012 pp. 17.

Patnaik U. Eternal trade, domestic employment an food security: Recent outcomes of trade liberalization and neo-liberal economic reforms in India. At: international Workshop on policies against Hunger III. Berlin, German Federal Ministry of Consumer Protection, food and Agriculture, 20-22 October 2004.

Pelletier D et al. The effects of malnutrition on child mortality in developing countries. Bulletin of the World Health Organization 1995;73:443-8.

Pistorius R, van Wijk J . The exploitation of plant genetic information. Political strategies in crop development. Oxon, CABI publishing 1999.

Radhakrishna R. Food and Nutrition security of the poor: emerging Perspectives and Policy Issues. Economic and Political Weekly 2005; April 30th: 1817-1821.

Rajaratnam J, Abel R, Asokan JS, Jonathan P. Prevention of Anemia among adolescent Girls of rural Tamil Nadu. Indian Pediatrics 2000; 37:532-36.

Sazawal S, et al. Efficacy of Zinc supplementation during acute diarrhea on duration and severity of the episode- a community based double-blind controlled trial. N Eng J Med 1995; 333:839-844.

Sazawal S, et al. Zinc supplementation reduces the incidence of acute lower respiratory infections in infants and preschool children: a double -blind controlled trial. Pediatrics 1998; 102: 1-5.

Solomons NW & Schumann K (2004) Update on vitamin A-related deaths in Assam , India . Am J Clin Nutr 80, 1083–1084.

Solution Exchange. Reply of Ramachandran, N; Ramachandran P; Kapil U; Nambiar V; Indira Chakravarty; [se-food][se-mch] Query: Use of Fortified Foods and Micronutrient Malnutrition in Children - Examples; Experiences, 2010. http://www.solutionexchange-un.net.in/se.html

Shrivastava SR, Shrivastava PS, Ramasamy J. The Mid Day Meal scheme: A holistic initiative to augment the nutritional and educational status of the children. J Med Soc 2014;28:38-9.

Steer P et al. British J Obs & Gyne 2007.

Toteja GS & Padam Singh. Micronutrient Profil of Indian Population. ICMR 2004.

Toteja GS, Singh P , Dhillon BS & Saxena BN. Vitamin A deficiency disorders in 16 districts of India . Indian J Pediatr 2002 69, 603–605.

Teilsch JM et al 2006). Lancet 2006; 367: 133-152 and editorial 90-91

UNICEF. State of the World's Children. New York, NY, UNICEF 1994.

Vijayraghavan K, Radhaiah G, Praksam BS, Sarma KVR & Reddy V (1990) Effect of massive dose vitamin A on morbidity and mortality in Indian children. Lancet 1990; 336, 1342–1345.

World Food Program. Indiamix: Development of low cost fortified blended food.

World Food Program. Reducing Hungry Tackling Poverty: Food Aid Intervention in India (Country Program Report 1997-2002), WFP 1999 New Delhi.

http://www.wfp.org/countries/india

CHAPTER 19

NATIONAL PROGRAM FOR CONTROL OF BLINDNESS

INTRODUCTION

Economic blindness is the level of blindness that prevents an individual from earning his wages. The inability to count fingers from a distance of six meters with the better eye, with the best possible correction, denotes economic blindness. There is diminution of field vision to 20^0 or less in better eye. In most of the surveys, the presenting vision <6/60 in the better eye is defined as blindness, though the WHO categories this as severe visual impairment. Since this level of visual impairment hinders a person from earning, it is also referred to as **work vision**.

Legal Blindness is the level of blindness that necessitates welfare measures and legal protection. Vision less than 6/60 or 20/200 or less in the better eye, with correction, and /or a visual field less than 10 degrees centrally constitutes legal blindness. This definition was included in the Revenue Act in USA in 1944. According to NPCB blindness is "inability of a person to count fingers from a distance of 6 meters or 20 feet Technical Definition or Vision 6/60 or less with the best possible spectacle correction or diminution of field vision to 20° or less in better eye."

Social Blindness is the degree of disability that hampers an individual from socially interacting with the family and peer in satisfactory manner. This implies a serious handicap in education, social interaction and personality development. The inability to count fingers at a distance of 3 meters (with the better eye) with best correction (vision 3/60 or diminution of field of vision to 10^0) is used to define social blindness.

Manifest Blindness is a visual acuity of 1/60 or just perception of light in the better eye.

Absolute Blindness is the inability to perceive light in any eye.

Curable Blindness is that stage of blindness where the damage is reversible by prompt management , e.g. cataract.

Preventable blindness is the loss of vision that could have been completely prevented by institution of effective preventive or prophylactic measures, e.g. xerophthalmia, trachoma, and glaucoma.

Avoidable blindness is the sum total of preventable or curable blindness is often referred to as avoidable blindness.

Visual Acuity is the sharpness of vision, measured as the maximum distance at which a person can see a certain object, divided by the maximum distance at which a person with normal eyesight can see the same object. The WHO has defined *blindness* as "visual acuity of less than 3/60 (Snellen) or its equivalent", and for the nonspecialized personnel it is further described as "inability to count fingers in daylight at a distance of 3 meters". According to National Program for Control of Blindness (NPCB) it is social blindness (Table 19.1). Comparative definition of impairment and blindness are given in table 19.1. 90% of the world's blind are poor and live predominantly in developing countries. Poor are less likely to gain access to health

and those who are suffering from eye sight defect loosing their jobs and face a steep reduction in income. So poverty is caused by blindness and vice versa. There is another angle to the problem. Blindness is also associated with inequality: in education, in recreation, in jobs, in social status that affects mental and social life of individual and family.

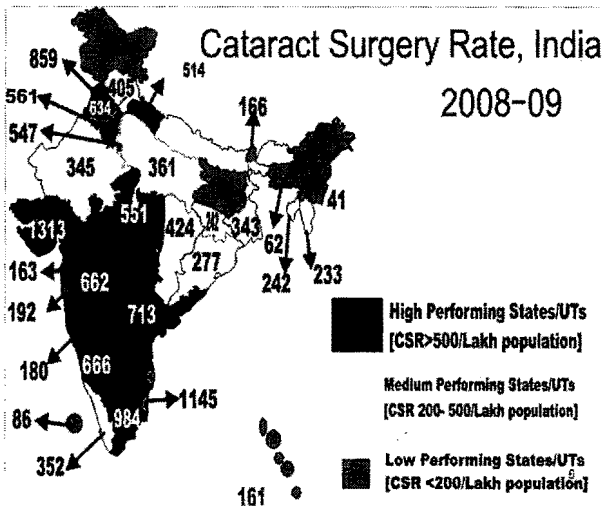
Table 19.1: Comparison of WHO and NPCB definitions

WHO-ICD	Visual Acuity	NPCB
Low Vision		
Category (1)	<6/18-6/60	Low vision
Category (2)	<6/60-3/60	Economic Blindness
Blindness		
Category (3)	<3/60-1/60	Social Blindness
Category (4)	<1/60-perception	Manifest Blindness
Category (5)	No perception of light	Absolute Blindness

BURDEN OF DISEASE

Global blindness trends indicate that the prevalence of blindness in the general population is highest in the African continent (average of 1.2%), followed by Asia 0.75%, Latin America 0.5% and the others including North America, Europe, Oceania, Japan and USSR 0.2%.

Out of 37 million people across the globe who are blind, India has 12 million blind persons. But the economically blinds according to the National Health Survey (ICMR 1974) was 1.38% and according to National Program for Control of Blindness/ WHO survey (NPCB/WHO 1986-89) 1.49%. Current prevalence of blindness (Visual acuity <6/60) in India is 1.0% in 2006-2007 (NPCB survey). Of 12 million 26% of children suffering due to corneal disorders. Uttar Pradesh has the highest number of blinds (TOI May 2008).



In a national survey, the prevalence of blindness in the population of above 50 years (presenting vision <6/60 in better eye) was 8.5%. The World Health Organization (WHO) uses presenting vision <3/60 in the better eye for international comparisons. Using this cut off, the prevalence was 5.34%. The prevalence varied from a low of 4.2% to a high of 13.7% across the different districts (Murthy et al 2005). Main causes of blindness are as follows: - Cataract (62.6%) Refractive Error (19.70%), Corneal Blindness (0.90%), Glaucoma (5.80%), Surgical Complication (1.20%), Posterior Capsular Opacification (0.90%), Posterior Segment Disorder (4.70%), Others (4.19%). Estimated National Prevalence of Childhood Blindness /Low Vision is 0.80 per thousand.

The major causes of blindness are:

- Cataract
- Refractive errors
- Glaucoma
- Corneal pathologies

The major causes of childhood blindness are:

- Visual impairment due to uncorrected refractive errors
- Vitamin A deficiency
- Developmental cataract
- Retinal conditions
- Optic atrophy
- Congenital anomalies

Cataract: When the normally clear lens or its capsule becomes opaque or milky, thereby decreasing vision by obstructing passage of light rays. It could be due to congenital, traumatic, secondary to other eye or systemic diseases, and senile causes.

Glaucoma: is a condition in which there is an increase of pressure within the eyeball, which causes permanent damage to the optical nerve at the back of the eye. Sudden rise in pressure causes acute glaucoma, but when the pressure increases gradually then it causes a chronic glaucoma which is more common in type.

Refractive errors: When rays of light do not focus on the retina, but either in front or behind the retina. Myopia is short sightedness and hypermetropia is far sightedness. Presbyopia is also a refractive error in which lens is not able to change its shape due to weakness of muscles in the eyes.

According to NPCB Pilot Survey 2001-2002, the major blinding conditions in + 50 year population are cataract (62.6%), uncorrected refractive errors (19.7%), corneal opacity (0.9%), glaucoma (5.8%), Posterior segment disorders (4.7%), and surgical complications (1.2%) Posterior Capsular Opacification 0.9%) and others (4.1%). Blindness due to smallpox, trachoma and vitamin A deficiency has gone down remarkably. With socioeconomic development and improvement of personal hygiene the incidence of infections has come down. Although the prevalence of blindness has increased from 1.3% in 1971 to 1.49% in 1986. Assam has 4% blind whereas Andhra Pradesh has 2.24%. Other states which has high number of blindness are UP, Maharashtra, Tamil Nadu, Orissa, Madhya Pradesh, Bihar, and Haryana. The blindness due to cataract has increased from 55% (1971) to 81% (1986). It is observed that blindness is more common in rural than urban areas, more in females than in males, and more amongst the poor than rich. Incurable blindness is just 10% of the total only. In children of 5-15 years of age the visual impairment is 6.4% and major cause of which is refractive error (81.7%).

Factors affecting the prevalence of blindness
The important factors responsible for high prevalence of blindness (Murthy et al. 2002) are:

a) increase in population size,
b) increase in life expectancy,
c) lack of surgical services, inadequacy and under-utilization of available manpower,
d) lack of nutrients such as vitamin A due to various diet associated factors,
e) environmental factors such as unsafe water and sanitation predispose to high infection rates, and
f) factors of gender, socioeconomic status, myths and misconceptions and religion.
g) Lack of community awareness and poor health seeking behavior.

HEALTH POLICY

Health Policy 2002 has set up a goal of reducing prevalence rate of blindness less than 0.5% by 2010.

PROGRAM

India was the first country in the world to launch national level blindness control program. The National Program for Control of Visual Impairment and Blindness was launched in 1976 as a 100% centrally sponsored and incorporates the earlier Trachoma Control Program that was started in 1963. The program was decentralized in 1994-95 with formation of district blindness control society (DBCS) in each district of the country.

Goals

- To reduce the prevalence of blindness (1.49%, 1986-89) to less than 0.3%;
- To establish an infrastructure and efficiency levels in the program to be able to cater new cases of blindness each year to prevent future backlog.

Objectives

1. To reduce the backlog of blindness through identification and treatment of blind;
2. To develop comprehensive eye care facilities in every district;
3. To develop human resources for eye care services;
4. To improve quality of service delivery,
5. To secures participation of civil society, NGOs, and the private sector in eye care, and
6. To enhance community awareness on eye care.

Eleventh Five Year Plan

Following target has been set for 11th Five year plan:

- Prevention and control and management of Diabetes retinopathy.
- Hospital based Screening of Glaucoma and prevention of childhood blindness.
- Improvement in the visual outcome of cataract surgery by performing IOL implantation.
- Development of Pediatric Ophthalmology Units.
- Setting up vision centers in rural areas.
- Development of fully functional eye bank networks.
- Developing human resource and institutional capacity.

Strategies

The four pronged strategy of the program is:

1. Developing institutional capacity
2. Developing human resources for eye care,
3. Strengthening service delivery, and

4. Promoting outreach activities and public awareness.

1. Development of institutions: Efforts are made to improve institutional infrastructure for better eye care. Other Non-Governmental Organizations and private sectors are involved for strengthening the capabilities.

2. Development of manpower: The program is meant to strengthen technical and managerial capacity of the eye care staff of different levels by training manpower for management at district level and by training of manpower of surgical services.

3. Strengthening Service Delivery: The program aims to improve the physical, technical and managerial capabilities of medical colleges, district hospitals, community health centers, primary health centers and selected nonprofit institutions to provide high quality cataract treatment. Strengthening of service delivery is ensured through:

1. Adhering to the norms for service delivery,
2. Increasing the output of resources allocated,
3. Regularization of organization of camps,
4. Involvement of NGOs and private sector, and
5. Expansion of coverage to tribal & remote rural areas.

4. Promotion of outreach activities and public awareness program: District Blindness Control Society is in a position to start eye care activities on its own and may take the help of information, education and communication (IEC) system and attempt should be made to reach maximum number of people through IEC campaign. School eye screening program helps in detecting the blindness early and able to correct refractory errors.

Revised strategies

1. To make the National Program for Control of Blindness more comprehensive by strengthening services for other causes of blindness like corneal blindness (requiring transplantation), refractive errors in school going children, improving follow-up services of cataract operated persons and treating other causes of blindness like glaucoma;
2. To shift from eye camp approach to a fixed facility surgical approach and from conventional surgery to IOL implantation for better quality of post operation vision in operated patients;
3. To expand the World Bank project activities like constructions of dedicated eye operation theatres, eye wards at district level, training of eye surgeons in modern cataract surgery and other specialized procedure and supply of ophthalmic equipment, etc. to the whole country.
4. To strengthen participation of voluntary organizations in the program and to earmark geographic areas to NGOs and govt. hospitals and improve the performance of govt. units like medical college, district hospitals, CHC, PHCs, etc.
5. To enhance the coverage of eye care services in tribal and other under served areas through identification of bilateral blind patients, preparation of villages wise blind register and giving preference to bilateral blind patients for cataract surgery.

Activities

1. *Cataract Operation:* To strengthen eye care services by additional input and improving the efficiency at different levels. Intra-Ocular Lenses (IOLs) implantation has increased in many states with the assistance of World Bank. Minimum target for cataract surgery rate per lakh population was set as 400 per year. There are some states which have the rates less than 200 per year. The unit cost of providing a cataract surgery is highest in private hospital (Rs. 5331), followed by NGO hospital (Rs. 4977) and government camps (Rs. 2143). The cost effective method was NGO-organized screening camp supplemented by surgery of screened persons at base hospital (Rs. 1128).
2. *Involvement of NGOs:* For this the voluntary organizations are encouraged to organize eye camps in remote rural and urban areas along with District Health Organization. NGOs are playing a significant role in cataract surgeries. Grant-in-aid to NGOs is provided through District Blindness Control Societies (DBCS) throughout the country. NGOs are also given grant-in-aid to set up eye banks to promote collection of donated eyes.
3. *Civil Works:* construction of eye wards, operation theatres, and dark rooms were undertaken in 7 states under the World Bank assisted project.
4. *Training:* Imparting training to eye surgeons both as trainers and as surgeons who will be

implementing IOL. PHC medical officer, Ophthalmic Assistant, Ophthalmic health workers.

5. *Commodity Assistant:* Commodities like suture and IOLs, indirect ophthalmoscopes, slit lamps, keratometers, A-scan Biometers, Yag Lasers are procure centrally and distributed to states and DBCSs. However, drugs, spectacles are procured locally by DBCS.
6. *Information Education and Communication:* posters, video spots, radio jingles, etc. in all regional languages.
7. *Management Information System:* a software is developed to facilitate data completion at 25 sentinel surveillance units in medical colleges.
8. *Monitoring and Evaluation:* Rapid assessment survey, facility survey and a beneficiary assessment survey in 1997-99, visual outcomes survey in 1999-2000. A comprehensive blindness survey has been carried out and under process in 13 districts.
9. *School Eye Screening Program:* 6%-7% of children aged 10-14 years have problems with their eye sight affecting their learning at school. Children are being first screened by trained teachers. Children suspected to have refractory errors are confirmed by ophthalmic assistants. Corrective spectacles are prescribed or provided free of cost to the poor.
10. *Collection and Utilization of donated eyes:* Currently nearly 20,000 donated eyes are collected per annum in India. Many donation programs are operating in the country for more donation.

Other Major Activities

Control of Vitamin A Deficiency: This is a main cause of nutritional blindness among children. Therefore Vitamin A solution (2 lakh IU except < 1 year of child who received 1 lakh IU) is given orally to every child every six month till the age of 5 year. This component was included in Child Survival Safe Motherhood Program (CSSM Program, now it is the part of Reproductive and Child Health Program).

Control of trachoma: The main activity is chemotherapeutic intervention to reduce severity, lower the incidence and in the long run decrease the prevalence of trachoma.

a) Chemotherapy:
   i) Mass treatment: It is given to the entire community when prevalence of severe and moderate trachoma is more than 5 percent in children under 10 years. Village Health Guide and health workers are involved under the program for better community participation. The treatment consists of the application twice daily of tetracycline or erythromycin 1% ointment for 5 days each month for six consecutive months.
   ii) Selective Treatment: In communities, with low prevalence, treatment is given to individuals after case identification.

b) Surgical Correction: It is done for individual with lid deformities.

Ophthalmic Assistant: Positioning of ophthalmological assistant at PHC/CHC levels for program activities is essential.

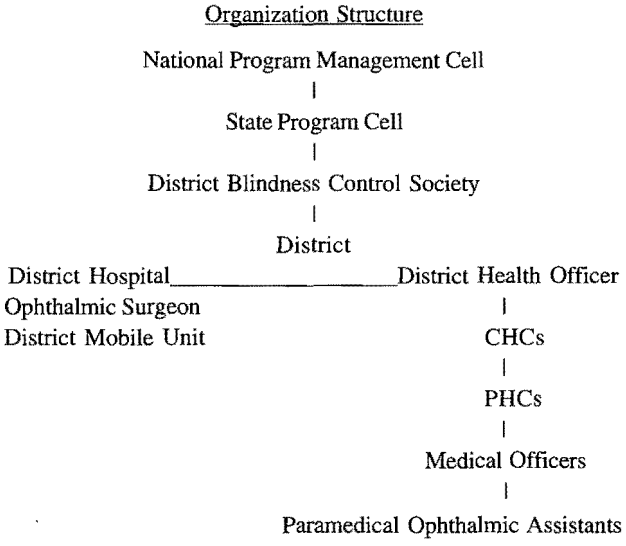
Organization

National Level: NPCB is managed by the Directorate General of Health Service, Min. of health & Family Welfare, New Delhi. At the ministry level there is a National Program Management Cell, which has two divisions.

1. Technical Division (Deputy Director General)
2. Administrative Division (Addl. Secretary / Joint Secretary)

The central government has allocated Rs. 1550 crore under the 11th Plan for National Program which was just Rs. 450 crore in 10th Plan.

Organization Structure



State Level: State Coordination committees and Ophthalmic Cell comes under the State Health Society.

District Level: District Blindness Control Society

1. District Hospital
   a) Ophthalmic Surgeons
   b) District Mobile Unit
2. District Health Officer
   a) Community Health Centers (Medical officers)
      i) Paramedical Ophthalmic Assistants
   b) Primary Health Centers (Medical Officers)

District Blindness Control Society (DBCS)/ District Health Societies

The main objective of the DBCS is "to achieve the maximum reduction in avoidable blindness in the district through optimal utilization of available resources in the district". Planning for national program for prevention and control of blindness was carried out from central level till 1990. To start planning at the peripheral level the program was finally decentralized. This society acts to implement, monitor and keep the financial account of the program under chairmanship of the District Magistrate/Collector. The program includes:

a) **Comprehensive eye care** - To assess the magnitude of the problem; to provide the blind and visually handicapped population with total eye care by integrating the curative, preventive and rehabilitative activities,
b) **School eye screening** - this program has been taken up for correction of refractive errors in school children,
c) **Community based rehabilitation** program for the incurably blind, including visual impaired, disabled and the handicapped persons. The program is implemented through governmental officials (DBCSs), NGOs and other local leaders after getting funds from the center under various schemes.

Manpower and Infrastructure: Infrastructure available in the country by the year 1994-95 is as follows: At the top there is a National Institute of Ophthalmology (Dr. Rajender Prashad Center for Ophthalmic Science, New Delhi) for manpower development, research and referral services. At the state level there are 19 state ophthalmic cells, and 63 medical colleges are involved for the manpower development, research and referral services. At the district level there are 593 District Blindness Control Societies, 593 district hospitals, and 221 District Mobile Units are functioning. At the Primary Health Center level there are 4458 PHCs are having ophthalmic services. In the country there are 109 eye banks functioning collecting 25,000 corneas annually. Over 300 dedicated operation theaters and Eye wards are constructed in the seven states having the highest prevalence rate of cataracts. There are 8,000 optometrists in India whereas requirement is 40,000.

NRHM and DBCS

Due to implementation of NRHM the State and District Blindness Control Societies are merged with State Health Societies and DHSs. They are authorized to undertake various activities related to Information, Education and Education (IEC) at the district level. Local IEC activities include identification and motivation of potential beneficiaries, information through media, educating voluntary groups and teachers and other community based volunteers and Accredited Social Health Activists (ASHA) identified under National Rural Health Mission. Interpersonal communication is the most effective method for motivation of target population. Such identified persons may be given one day orientation on blind registry, motivation and assistance in getting services for the affected population. The orientation program would be organized at PHC/CHC.

New initiatives

- Construction of dedicated Eye Wards and Eye Operation theaters in Districts and Sub Districts Hospitals in North-Eastern States, Bihar, Jharkhand, J&K, Himachal Pradesh, Uttaranchal and few other States as per demand.
- Appointment of Ophthalmic Surgeons and Ophthalmic Assistants in District Hospitals and Sub District Hospitals.
- Appointment of Ophthalmic Assistant in PHCs/ Vision Centers where there are none (at present ophthalmic assistants are available in block level PHCs only).
- Appointment of Eye donation Counselors on contract basis in Eye Banks under. Government Sector and NGO Sector.
- Grant-in-aid for NGOs for management of other Eye disease other then cataract like Diabetic, Retinopathy, Glaucoma Management, Laser Technique, Corneal Transplantation, Vitreoretinal Surgery, Treatment if childhood blindness etc. of Rs. 750 per case for Cataract/ IOL Implantation

surgery and Rs. 1000 per case other major Eye Disease as described above For north-Eastern States, Hilly and Desert Areas Rs. 850 for Cataract and Rs. 1100 for other major Eye care Management is proposed.

- Telemedicine in Ophthalmology {Eye Care Management Information and Communication net work}
- Vitamin A supplementation and M.M.R Vaccination through DBCS corpus funds as per requirement to take care of childhood Blindness.
- Setting up of five Centers of Excellence for Eye Care Services.
- Provision of vehicles to state program managers and District
- Program Managers under NPCB.
- Provision of Computes, Fax and photocopier to District Blindness Control Societies under NPCB.
- Involvement of private Practitioners.
- A provision of Rs. 1550 crore has been proposed to implement various activities under the program.
- Development of mobile ophthalmic units in NE States, Hilly States and in difficult terrains for diagnosis and medical management of eye diseases.

Role of International Agencies

World Health Organization (WHO): WHO is assisting NPCB in organizing in following areas: 1) 40 intra-country Fellowship in Institutes of Excellence under various specialities including corneal transplantation, vitero-retinal surgery, lasers in ophthalmology and pediatric ophthalmology; 2) Survey on childhood blindness in East Delhi to estimate prevalence and causes of blindness in children below 15 year of age; 3) Study on refractive errors in school dropouts; 4) Establishing National Surveillance Unit at RP Center AIIMS, New Delhi; 5) Launch workshop on "Vision 2020: The right to sight" initiative; 6) Publications of newsletters and other prototype material under NPCB; and 7) Publication of training modules for various categories; 8) Celebrating "World Sight Day" on 11th October every year.

Danish International Development Agency (DANIDA): The Government of India has signed an agreement with the Denmark to receive the assistance in following activities: a) Manpower development, b) Establishment of management systems at state level, c) Establishment and development of monitoring and evaluation system, d) Preparation of health education material, teaching and information aids; and e) Training.

World Bank: World Bank had assisted Cataract Blindness Control Project, in which Rs. 554 crore had spent for next 7 years starting from 1994-95. Major inputs of the project were upgrading the ophthalmic services, expanding the coverage in rural and tribal areas, establishment and functioning of District Blindness Control Society, training of ophthalmic manpower, improvement of management system, providing IOL implants, and creating awareness about the program in the masses. The impact of this project was in IOL implantation which increased from 3% to 75% in 2002.

COMMENTS

1. Although the program is designed very well and highly appreciable but to get the plan implemented more political and community participation is required which is lacking currently. In recent years the focus is moved to Cardiovascular diseases and Diabetes among non-communicable diseases therefore not much improvement has been observed.
2. Simple measures like facial cleanliness and environmental sanitation which can be improved by public awareness and participation need to be emphasized more to reduce eye diseases like trachoma.
3. Quality of service is one of the area where maximum input should be given because this is going to be one of the most important motivating factor for program acceptance.
4. Eye surgeon per 1000 people in India is just 0.95 as compare to Maldives (1.14) however, in this Southeast region India is comfortable regarding the number of eye surgeon but much less as compare to developed world.
5. Goal of achieving prevalence of blindness to 0.3% by the year 2000 is not achieved that need to be taken seriously and comprehensive review of the strategies should be conducted and appropriate measures should be undertaken.
6. There is an inadequate MIS for blindness which causes lack of monitoring and evaluation of the program activities.
7. Lack of orientation to community ophthalmology

practice and managerial skills is a major lacuna in the program. Recently, efforts have been directed towards improving skills of all categories of personnel involved in eye care.

8. The poor coordination and lack of involvement of the vast number of private ophthalmic surgeons in the program.
9. In some places Vitamin A deficiency in primary school is as high as 9.8 to 13.8% that is a very serious concern and need to be handled urgently.

VISION 2020

Regional Strategy of WHO for Vision 2020: Right to Sight

It has been estimated that blindness costs the world $ 25 billion annually in lost productivity. The cost is three times higher if the cost of rehabilitation care givers is included. A global initiative has been initiated to reduce avoidable (preventable and curable) blindness by the year 2020. India has also committed to this initiative. Plan of action for the country has been developed with following main features:

1. Target diseases: Cataract, refractive errors, childhood blindness, corneal blindness (trachoma, onchocerciasis), glaucoma, diabetes retinopathy.
2. Preventive interventions: Strengthening of vitamin A supplementation; prevention of trauma to eyes in industry, agriculture, and household, etc.; restricted use of steroid combinations; screening, referral and treatment of minor ailments at primary level; integrate with immunization, ICDS, RCH program; school eye screening program for detection and correction of refractive errors; IEC for public awareness.
3. Human resource development: Augmenting middle level ophthalmic personnel and increasing the capacity and skills of available human resources in various areas of ophthalmology. Development of professional eye care managers, etc.
4. Infrastructure development: Proposed structure includes centers of excellence (20), training centers (200), services centers (2000), and vision centers (20,000).

   Vision center at the primary level

   1. Refraction and prescription of glasses
   2. Primary eye care
   3. School eye screening program
   4. screening referral services

   Service Centers at the secondary level

   1. Cataract surgeries
   2. Other common eye surgeries
   3. Facilities for refraction
   4. Referral Services

   Training center at the tertiary care level

   1. Tertiary eye care including retinal surgeon, corneal transplant, glaucoma surgery;
   2. Training and CME

   Center for Excellence

   1. Professional leadership
   2. Strategic development
   3. CME
   4. Laying of Standard and Quality assurance
   5. Research

XIIth Five Year Plan

The XIIth Five Year Plan (2012-17) for Elimination of Avoidable Blindness from India

Main Objectives

a To secure the participations of the Non-Governmental Organizations

b. The four key expectations included

1. Adopt area for eye-care services (Block or group of villages),
2. Identify the blind, organise screening camps and transport patients to base hospitals;
3. Provide medical/laser/surgical rehabilitative treatment; and
4. Ensure follow-up

Strategies

Five key strategies to achieve the objectives, included:

1. Decentralise the implementation of the programme and manage though the State and District Health Societies
2. Increase participation of the voluntary organizations, including the Private sector
3. Train personnel (eye health team), provide support for equipment, monitor and follow-up for Quality Assurance, and
4. Ensure convergence with other Sectors (multi-sectoral action at district level) and schemes, i.e., with leadership, supervision and monitoring from the District Collector to ensure convergence with the:

i. District Rural Development Authority (DRDA), Social Welfare, Media, District Education Officer (DEO).
ii. A focus on the illiterate women in convergence with other schemes, and
iii. Participation, including that of Community and the Panchayati Raj Institutions (PRI).

5. Assistance for Other Eye Diseases (OED), besides Cataract.

VISION 2020 INDIA perceives the five major challenges which need to be overcome in the XIIth Five Year Plan and are:

1) NGO / voluntary sector participation
2) Strengthened public sector
3) Convergence- convergence and involvement in Panchayati Raj and other institutions, and involvement in other schemes. The improvement of Primary Eye Care and Refraction Services is the area of greatest need which needs to be strengthened in the XIIth Plan.
4) Rehabilitation services

a. Rehabilitation services for those with visual impairment or blindness need to be strengthened and cross sectoral programmes such as Sarva Shiksha Abhiyan (SSA) for eye care of children

5) Human resources: Human Resources particularly at sub-district level NGO partnership

Three strategies are critical for the XIIth Five year plan, i.e.,

1. Strengthening partnership with the Non-Governmental Sector (NGOs) through enhanced Grant-in-aid and transparent Management Information Systems.
2. Strategies for cross-sectoral programs with Panchayati Raj Institutions (PRI), women and children's programs, etc.
3. Strengthening of Rehabilitation Services

Suggestions

Convergence with Sarva Shiksha Abhiyan (SSA)
SSA is a good platform for disseminating eye care knowledge. A centralized curriculum focusing on eye care, sanitation and education may be developed to be used in primary and secondary schools

1. Early identification of children with eye problems, low vision and blindness.
2. Functional assessment and ophthalmic examination of all children
3. Provision of low vision devices and other educational devices to children with low vision.
4. Provision of Braille kit, Braille books and mobility devices to children with blindness.
5. Providing treatment, surgical intervention, medicines and spectacles to children.
6. Training of regular teachers as regards the specific needs of children with low vision and blindness and eye conditions.
7. Appointment of special educators for ensuring education of children with low vision and blindness.

TOWARDS UNIVERSAL EYE HEALTH: A GLOBAL ACTION PLAN 2014–2019

Recognizing that globally, 80% of all visual impairment can be prevented or cured and that about 90% of the world's visually impaired live in developing countries; For 2010, WHO estimated that globally 285 million people were visually impaired, of whom 39 million were blind. According to the data for 2010, 80% of visual impairment including blindness is avoidable. The two main causes of visual impairment in the world are uncorrected refractive errors (42%) and cataract (33%). Cost-effective interventions to reduce the burden of both conditions exist in all countries. Visual impairment is more frequent among older age groups. In 2010, 82% of those blind and 65% of those with moderate and severe blindness were older than 50 years of age. Poorer populations are more affected by visual impairment including blindness.

The global action plan 2014–2019 aims to sustain and expand efforts by Member States, the Secretariat and international partners to further improve eye health and to work towards attaining the vision just described. Its goal is to reduce avoidable visual impairment as a global public health problem and to secure access to rehabilitation services for the visually impaired by improving access to comprehensive eye care services that are integrated into health systems. Five principles and approaches underpin the plan: universal access

and equity, human rights, evidencebased practice, a life course approach, and empowerment of people with visual impairment.

Three objectives
– objective 1 need for generating evidence on the magnitude and causes of visual impairment and eye care services and using it to advocate greater political and financial commitment to eye health;
– objective 2 encourages the development and implementation of integrated national eye health policies, plans and programmes to enhance universal eye health with activities in line with WHO's framework for action for strengthening health systems to improve health outcomes;
– objective 3 addresses multisectoral engagement and effective partnerships to strengthen eye health. Each of the three objectives has a set of metrics to chart progress.

The three indicators comprise: (i) the prevalence and causes of visual impairment; (ii) the number of eye care personnel; and (iii) cataract surgery.

As a global target, the reduction in prevalence of avoidable visual impairment by 25% by 2019 from the baseline of 2010 has been selected for this action plan. In meeting this target, the expectation is that greatest gains will come through the reduction in the prevalence of avoidable visual impairment in that portion of the population representing those who are over the age of 50 years. By 2019, it is estimated that 84% of all visual impairment will be among those aged 50 years or more. Expanding comprehensive integrated eye care services that respond to the major causes of visual impairment, alongside the health improvement that can be expected to come from implementing wider development initiatives including strategies such as the draft action plan for the prevention and control of noncommunicable diseases 2013–2020, and global efforts to eliminate trachoma suggest the target, albeit ambitious, is achievable. In addition, wider health gains coming from the expected increase in the gross domestic product in low-income and middle-income countries will have the

World Health Assembly: 51.11 Resolution
Global elimination of blinding trachoma
Recognizing that blinding trachoma still constitutes a serious public health problem amongst the poorest populations in 46 endemic countries; there are at present some 146 million active cases of the disease, mainly among children and women, and that in addition, almost 6 million people are blind or visually disabled as a result of trachoma. It has been recognized that there is a need for sustainable community based action-including **S**urgery for inturned eyelids, **A**ntibiotic use, **F**acial cleanliness and **E**nvironmental improvement (the **SAFE** strategy) - for the elimination of blinding trachoma in the remaining endemic countries. WHO calls on member states:

1. To apply the new methods for the rapid assessment and mapping of blinding trachoma in the remaining endemic areas;
2. To implement, as required, the strategy including **S**urgery for inturned eyelids, **A**ntibiotics use, **F**acial cleanliness and **E**nvironmental improvement (the SAFE strategy) for the elimination of blinding trachoma;
3. To collaborate in the WHO alliance for the global elimination of trachoma and its network of interested parties for the global coordination of action and specific support; and
4. To consider all possible inter-sectoral approaches for community development in endemic areas, particularly for great access to clean water and basic sanitation for the populations concerned.

WHO simplified Trachoma Grading scale based on clinical examination with a loupe (X 2-2.5) or by examination of conjunctival slides with loupes, as follows:

***TF** (Trachomatous inflammation-follicular):* Presence of five or more follicles in the upper tarsal conjunctiva

***TI** (Tracho-inflammation Intense):* Pronounced inflammation thickening of the upper tarsal conjunctiva that obscures more than half of the normal deep tarsal vessels.

Clinically active Trachoma: Defined as either TF or TI by the examination.
Treatment: Single dose of oral azithromycin (20mg/kg) or 250mg capsule in <18yrs and 1 gm in >18 yrs can be given either in mass therapy or targeted household. Targeted therapy is less expensive and having good control.

References

Awate RV, Ketkar YA, Somaiya PA. Prevalence of nutritional deficiency disorders among rural primary school children (5-15 yrs). J Ind Med Research 1997; 95 (7): 410-415.

Frick KD, Lietman TM, Holm SO, Jha HC, Chaudhry JSP, Bhatta RC. Cost effectiveness of trachoma control measures: comparing targeted household treatment and mass treatment of children. Bull WHO 2001; 79 (3): 201-207.

Gupta SK. Magnitude of Refractive Errors in India. Journal of Community Medicine 2006; 2(1): 9-13.

Holm SO, Jha HC, Bhatta RC, Chaudhry JSP, et al. Comparison of two azithromycin distribution strategies for controlling trachoma in Nepal. Bull WHO 2001; 79 (3): 194-200.

Murthy GVS, Gupta SK, Bachani D, Jose S and John N. Current estimates of blindness in India. British Journal of Ophthalmology 2005;89:257-260.

Murthy GVS, Gupta SK, Bachani D. The Principles and practice of Community Ophthalmology. National Program for Control of Blindness. Community Ophthalmology Section, Rajendra Prasad Center for Ophthalmic Sciences, AIIMS, New Delhi 2002.

Pruss A, Mariotti SP. Preventing trachoma through environmental sanitation: a review of the evidence base. Bull WHO 2000; 78 (2): 258-266.

Urmil AC, Dutta PC, Ahmed KA. A prevalence study of eye diseases among children in school in Pune. Ind J Comm Med 1988; 13:134-141.

WHO. Global Elimination of Blinding Trachoma (World Health Assembly Resolution: 51.11), WHO 1998.

WHO. Universal eye health: a global action plan 2014-2019. WHO 2013.

CHAPTER 20

NATIONAL IODINE DEFICIENCY DISORDERS CONTROL PROGRAM

PROJECT AGAINST MICRONUTRITENT MALNUTRITION

INTRODUCTION

Iodine is an essential micronutrient. It is required at 100-150 micrograms daily for normal human growth and development. Deficiency of nutritional iodine in the food/diet is called as Iodine Deficiency Disorders (IDDs). IDD affects people of all ages, both sexes and different socioeconomic status. Iodine deficiency during pregnancy leads to decreased availability of iodine to the foetus. This, in turn, leads to the decreased synthesis of thyroxine, an essential hormone manufactured by the thyroid gland of the foetus. The decreased availability of thyroxine prevents the normal developments of the foetal brain and body, a condition, which at birth can be diagnosed with the help of sophisticated investigations and is known as Neonatal Chemical Hypothyroidism (NCH). Such foetal brain damage is permanent and irreversible and irrevocably limits intellectual growth in later years. The various disorders associated with iodine deficiency are shown in Table -20.1

Various studies have documented that in areas with a incidence of mild to moderate iodine deficiency disorder, IQ of school children are on average 13 points (10-15 points) below those of children living in areas where there is no deficiency (Benoist 2002). The serious irreversible effects of IDD such as stillbirths, abortions, neonatal mortality and mental handicap are reported from many part of the world including India (Pandav 2005; Haddow 1999; Utiger 1999).

Table 20.1: Spectrum of Iodine Deficiency Disorders

Life stage	*Effect*
Fetus	Abortion Stillbirths Congenital Anomalies Increased Perinatal Mortality Increased Infant Mortality Neurological Cretinism mental deficiency, deaf, mutism spastic diplegia squint Myxedematous Cretinism dwarfism mental deficiency Psychomotor defects
Neonate	Neonatal Goiter Neonatal Hypothyroidism
Child and Adolescent	Goitre Juvenile Hypothyroidism Impaired mental function Retarded physical development
Adult	Goitre with its complication Hypothyroidism Impaired mental function

BURDEN OF DISEASE

Iodine Deficiency Disorders are a worldwide major public health problem. They affect a large segment of populations in all continents of our planet and have been with us from generations. As per information available, more than 1.5 billion people all over the world are at risk of IDD. IDDs are prevalent in 130 countries, affecting 13% of the world population.

In India, it is estimated that more than 350 million people are at risk of IDD, while the number of persons suffering from goitre and other iodine deficiency disorder is above 71 million. Among newborns, 8.1 million and among pregnant women, 8.9 million are at risk of IDD. The surveys conducted by the Central and State Health Directorates, Indian Council of Medical Research (ICMR) and Medical Institutes have clearly demonstrated that not even a single State/ Union Territory is free from the problem of IDD.

Sample surveys have been conducted in 28 States and 7 Union Territories, which have revealed that out of 324 districts surveyed so far, 263 districts are IDD endemic i.e. the prevalence of IDD is above 10 percent (Table 20.2). There is significant reduction in visible goiter in the country.

Classification of Goitre

Most classifications distinguish between different grades of goitre and broadly between visible and palpable goitre and record the presence or absence of nodules. Visible goitres, as a general rule, indicate a moderate to severe deficiency of iodine of a relatively long duration and thus tend to be more common among older people. Their presence in children suggests a severe deficiency of iodine. Similarly, nodules are likely to be present to a significant degree only in areas of marked deficiency of iodine for a very long period. Palpable goitres have a special significance in the assessment of the control program e.g. salt iodization program.

Grade Description

Grade 0: No palpable or visible goitre/no goitre.

Grade 1: A mass in the neck that is consistent with an enlarged thyroid that is palpable but not visible when the neck is in normal position. It moves upward in the neck as the subject swallows. Nodular alteration (s) can occur even when the thyroid is not enlarged/goiter palpable but not visible.

Grade 2: A swelling in the neck that is visible when the neck is in a normal position and is consistent with an enlarged thyroid when the neck is palpated/goitre visible and palpable.

Endemic District: The district is declared as endemic district if the total goitre rate is above 5% in the children of the age group 6-12 year surveyed.

Table 20.2: Statement showing the number of Districts surveyed & found endemic

State/UT	Distt. Surveyed	Endemic	Prevalent Districts %
Andhra Pradesh	12	11	91.6
Arunachal Pradesh	11	11	100
Assam	18	14	77.7
Bihar	14	14	100
Chattisgarh	2	2	100
Goa	2	2	100
Gujrat	16	8	50.0
Haryana	11	10	90.9
Himachal Pradesh	10	10	100
Jammu & Kashmir	14	14	100
Jharkhand	9	8	88.8
Karnataka	20	6	30.0
Kerala	14	12	85.6
Madhya Pradesh	14	14	100
Maharashtra	29	21	72.4
Manipur	8	8	100
Meghalaya	4	4	100
Mizoram	3	3	100
Nagaland	7	7	100
Orissa	8	7	87.5
Punjab	3	3	100
Rajasthan	4	4	100
Sikkim	4	4	100
Tripura	3	3	100
Tamil Nadu	29	18	62.1
Uttar Pradesh	29	23	82.1
Uttranchal	9	9	100
West Bengal	5	5	100
Andaman & Nicobar Islands	2	2	100
Chandigarh	1	1	100
Daman & Diu	1	1	100
Dadra & Nagar Haveli	1	1	100
NCT Delhi	1	1	100
Lakshdweep	1	0	0.0
Pondicherry	4	2	50
Total	**324**	**263**	**81.2**

IDD Prevalence indicators and criteria for classifying IDD as a significant public health problem

Severity of Public Health Problem			
Indicator	Mild	Moderate	Severe
Goiter>0 %	5-19.9	20-29.9	≥30
Median UIE (Microgram/l)	50-99	20-49	<20

Prevention

It is a well-established fact that with the exception of certain types of goiter, Iodine Deficiency Disorders are permanent and incurable. However, all these disorders can be easily prevented before they occur. The simplest method to prevent the broad spectrum of IDD is to consume iodated salt daily. This is the most effective and inexpensive mode to prevent IDD. The supply of iodated salt is to ensure availability of not less than 150 micrograms of iodine per person per day. Since salt is consumed by all everyday, the supply of iodated salt will ensure the availability of iodine for normal body function. The average consumption of iodated salt per person per day is about 10 gms. This consumption is in moderate amount.

Control Program - NIDDCP

Realizing the magnitude of the problem, the Government of India launched a 100 percent centrally assisted National Goitre Control Program (NGCP) in 1962. In August 1992, National Goitre Control Program (NGCP) was renamed the National Iodine Deficiency Disorders Control Program (NIDDCP) with a view to cover a wide spectrum of Iodine Deficiency Disorders like mental and physical retardation, deaf-mutism, cretinism, still-births, abortion etc.

Goal

The Government's goal of NIDDCP is to reduce the prevalence of iodine deficiency disorders below 10 percent in the entire country by 2012 A.D.

Objectives

The important objectives and components of National Iodine Deficiency Disorders Control Program (NIDDCP) are as follows:

1. Surveys to assess the magnitude of the Iodine Deficiency Disorders.
2. Supply of iodated salt in place of common salt.
3. Resurvey after every 5 years to assess the extent of Iodine Deficiency Disorders and the Impact of iodated salt.
4. Laboratory monitoring of iodated salt and urinary Iodine excretion.
5. Health education & Publicity

Policy

It had been established that consumption of iodated salt is the best and simplest way to prevent and control IDD. Based on the recommendations of the Central Council of Health in 1984, the Government took a policy decision to iodate the entire edible salt in the country by 1992. The program commenced in April 1986 in a phased manner. Since then the approach has been to enhance the production, demand and supply of iodated salt. The Central Government has issued the notification banning the sale of non-iodated salt for direct human consumption in the entire country with effect from 17th May, 2006 under the Prevention of Food Adulteration Act 1954.

Nodal Ministry

The Ministry of Health & Family Welfare is the nodal Ministry for policy decisions on National Iodine Deficiency Disorders Control Program (NIDDCP).

IDD Cell of Directorate General of Health Services

The Central Nutrition and Iodine Deficiency Disorders Cell at the Directorate General of Health Services (DGHS) is responsible for the implementation of NIDDCP in the country. The important activities of this being undertaken by the IDD Cell of the Directorate General of Health Services are as follows:

1. Technical guidance to the States/UTs.
2. Intersectoral coordination at Central level and maintenance of close liaison with the Ministry of Industry/Transport etc.
3. Coordination of the various facets of NIDDCP in States/UTs
4. Undertaking independent IDD surveys and monitoring in various States/UTs.
5. Imparting training to the State Health to whom Personnel, involved in NIDDCP.
6. Collection, compilation and analysis of relevant data from States/UT with a view to render more effective and meaningful advice.
7. Monitoring of the quality control of iodated salt at production level through the salt Commissioner and at the distribution and consumer level through the State Health Directorate.
8. Monitoring the procurement and distribution of iodated salt in States/UTs.
9. Managing the IEC activities at apex level.
10. Managing the financial and other physical aspects of State level IDD Cells.

The Salt Commissioner's Office under the Ministry of Industry is responsible for licensing, production and distribution of iodated salt to States/UTs. This office is also responsible for monitoring the quality of iodated salt at production level and the distribution of the same in the country.

The Salt Commissioner, in consultation with the Ministry of Railways, arranges for movement of iodated salt from the production centers to the States/UTs on priority basis.

States/Union Territory IDD Cell

Each State Government has an IDD Control Cell, which is responsible for:

1. Checking iodine levels of iodated salt with wholesalers and retailers within the State and coordinating with the Food and civil Supplies Department.
2. The Distribution of iodated salt within the State through open market and public distribution system.
3. Creating demand for iodated salt.
4. Monitoring consumption of iodated salt.
5. Conducting IDD surveys to identify the magnitude of IDD in various districts.
6. Conducting training.
7. Dissemination of information, education and communication.

The Director of Health Services (Food Health Authority) of each state/ UT issues notification banning the entry and sale of non-iodated salt in the respective state/ UT under Prevention of Food Adulteration Act (PFS), 1954.

Current status of program

- 33 States/UTs have established Iodine Deficiency Disorders Control Cells in their State Health Directorate.
- 34 States/UTs have already set up Iodine Deficiency Disorders monitoring laboratories while the remaining States are in the process of establishing the same.
- 365 districts have been surveyed till now
- In a survey carried out by ICMR, central and state health directorate and medical institutions, 365 districts were surveyed and out of which 303 districts were found to be endemic.
- To raise the awareness, song and drama division through their field units have been carrying out extensive special interactive programmes/ activities in 114 primary channels and in 6 regional channels through 37 vividha bharti channels and 24 FM channels .
- IDD Spots are being telecast through the Doordarshan daily.
- Messages about IDD and consumption of Iodated salt on computerized railway reservation tickets
- Global IDD Prevention Day is celebrated in all districts on 21 October every year.

Achievements of the Program

Achievements made under the major components of the existing Program from inception to date are as under:

1. The salt production policy has been liberalized and permitting production by the private sector. 824 private units have been licensed by the Salt Commissioner, out of which nearly 532 units have commenced production so for. The Plants have an annual production capacity of more than 222 lakhs MT which is much higher than requirement in the country.
2. The Ministry of Railways is providing priority arrangements (category 'B') for the transportation of iodated salt. This priority is second to that of Defense.
3. Since May 2006 the Central Government has issued the notification banning the sale of non iodated salt for direct human consumption in the country under the Prevention of Food Adulteration Act 1954.
4. Standard for iodated salt have been laid down under the Food Safety and standard Act. These stipulate that the iodine content of salt at the production and consumption levels should be at least 30 and 15 ppm respectively.
5. Cash grants are also provided by the Central Government for health education and publicity campaigns to promote the consumption of iodated salt.
8. The Nutrition and IDD Cell of the Directorate General of Health Services carrying out surveys and training of staff.
9. A National Reference Laboratory for the monitoring of IDD has been set up at the Bio-Chemistry and Biotechnology division of the

Table 20.3 : Current status of ten Programme indicators for tracking progress towards sustainable elimination of IDD in India

Indicator	Current status
Presence of a national multi-sector coalition	Partial Coalition exist but still preliminary stage
Demonstration of political commitment	Yes
Enactment of legislation and supportive regulations on universal salt iodization	Yes
Establishment of methods for assessment of progress in the elimination of IDD	Partial Reporting incomplete and irregular
Access to laboratories to provide accurate data on salt and urinary iodine levels and thyroid function.	Yes
Establishment of a programme of education and social mobilization	Partial Need for more focus on social mobilization & Behavior Change Communication (BCC)
Routine availability of data on salt iodine content, at the factory level at least monthly, and at the household level at least every five years.	Yes
Routine availability of population-based data on urinary iodine every five years	Partial
Demonstration of ongoing cooperation from the salt industry	Yes
Presence of a national database for recording of results of regular monitoring procedures which include population-based household coverage and urinary iodine	No

(Reference: Pandav CS et al 2013)

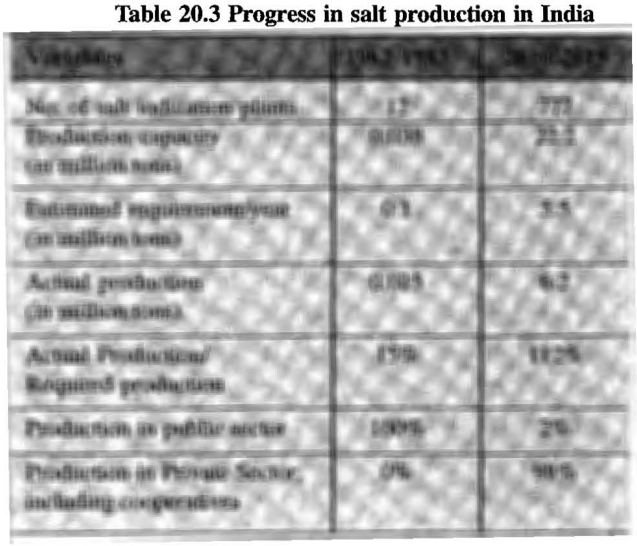
National Center for Disease Control, (formally NICD) Delhi and AIIH & PH Kolkata, for training medical and paramedical personnel and monitoring the iodine content of salt and urine.

10. Four regional IDD monitoring laboratories at the National Institute of Nutrition Hyderabad for South, All India Institute of Hygiene & Public Health, Kolkata, for East, All India Institutes of Medical Sciences New Delhi for West and National Institute for Communicable Diseases, Delhi for North have been declared for imparting training to both medical and para medical personnel, monitoring the iodine contents of salt and urine conducting Thyroid Function Test (TFT) under the program for the region.
11. For ensuring quality control of iodated salt at consumption level, testing kits for 'on the spots' qualitative testing have been distributed to all the District Health Officers.
12. A Program Implementation Committee under the chairmanship of Director General of Health Services has been constituted to review the program.
13. A Central Steering Committee has been set up under the chairmanship of Secretary (Health & Family Welfare) for effective coordination with other sectors.

Infrastructure

National Iodine Deficiency Disorders Controls Program at the Central level is being managed by Adviser (Nutrition) of the Directorate General of Health Services. An independent Nutrition & IDD Cell has been created under the Deputy Asst. Director General (IDD) with support of Research Officer (IDD) assisted by a team comprising a Technical Assistant, a Junior Investigator, Field Assistants, Field Attendants,

Table 20.3 Progress in salt production in India



a computer and other Ministerial staff. Each state is having their own IDD cell. Till now there are 31 IDD cells and 30 laboratories have been established.

Financial Assistance

Financial assistance is being provided to all the states/ UTs's in form of quarterly advance release of funds w.e.f. 2002-03 for various components under the program.

Current Status of Iodated Salt Production

Salt can be iodized with potassium iodide (KI) or potassium iodate (KIO3). However the latter is preferred for Indian conditions, as it is very stable and its melting point is 5300C. When potassium iodate is used as iodizing agent, the salt is called iodated salt. A coverage evaluation survey conducted in 2015 reported that 74% of salt consumption at household level was adequately iodized. For estimation of iodine content in iodized salt, a total of 11494 salt samples have been analyzed (2015) out of which 10829 (94%) salt samples were found confirming to the standard (>15 ppm). For estimation of urinary iodine excretion for bioavailability of iodine, 3586 urine samples have been collected and analyzed (2015) out of which 3467 samples were found confirming to the above 100 micrograms/litre (97%). For ensuring the quality of iodized salt at consumption level, a total of 1820398 salt samples were tested by salt testing kit (August 2015) out of which 1355406 (74%) salt samples were found confirming to the standard (>15ppm).

Guidelines For District IDD Survey

Survey Method

The IDD survey at the District may be conducted by using the method of Population Proportionate to Size (PPS) sampling in the age group of 6-12 years children. A budget of INR 50,000 for every district have been allotted for IDD survey.

Operational Manual for District IDD Survey

- Selection of villages/wards by PPS
- Get the list of villages/wards alongwith the population for the latest census. The data are available for all districts of the country on CD from Registrar General Office.
- Using the list of villages/wards, prepare the following table

S.N.	Name of Village	Population	Cumulative population
1.	Dhansa	9450	9450
2.	Jasola	8320	17770
3.	Rampur	5020	22790
4.	Budan	2010	24800
5.	Hatai	3200	28000 and so on

A sample of 30 villages/wards has to be selected from the district. The method of sampling to be used is PPS systematic sampling, which involves the following steps:

Total population of the district

Sample size = 30 villages/wards

Calculation of sampling interval

$$= \frac{\text{Total population}}{30} = k$$

Selection of random start from 1 to K say 'r'

Selected random numbers r, r + k, r + 2k, ... r+29k

A sample of 90 children (45 boys & 45 Girls) of age group of 6-12 years from the school and out of school/ household of selected village/ward has to be selected as explained below:

Suppose in selected village the school enrolment rates are

Boys = 70%

Girls = 60 %

The allocation of sample would be as under:

	Boys	***Girls***
School	32(70%)	27(60%)
Out of School	13(30%)	18(40%)
Total	***45***	***45***

Suppose in the selected village the enrolment rates are:

Boys = 40%

Girls = 30 %

Then, the allocation of sample of 45 boys and 45 girls to be selected form school and Out of school would be as under:

	Boys	*Girls*
School	18(40%)	13(30%)
Out of School	27(60%)	32(70%)
Total	***45***	***45***

Selection of Sample of children from school

- After allocation of total samples to schools and out of school, the next step relates to selection of a sample of children from the school.
- In the example considered earlier, a sample of 18 boys has to be selected out of those in the school; this has to be allocated to various primary classes preferably in equal proportion. If the number of classes is 5 then the sample would comprise of selecting 3 children each from class 1 and 2 and 4 children each from classes 3,4, & 5. The sample from each of the classes could then be taken from the attendance register out of those present in the class on the date of the survey using systematic sampling.

  Example: Suppose number of boys present in class 1 is 10. List all the boys in class and assign them serial numbers from 1-10. Since three boys are to be selected from class 1, draw a random number table. Let it be 2. Thus second boy in the list is selected in the sample and subsequently adding 3 twice to the number 2 the remaining two boys in the sample would be numbered 5 and 8 in the list. Follow this process for selecting boys from class 2.
- Enlist and assign serial numbers to all the boys in class 3, 4 and 5 separately. Since four boys each from class 3, 4 and 5 are to be selected, draw a random number between 1 and 4. Suppose the number drawn is 3. Select the 3rd boy from list prepared for Class 3. Add 4 three times to 3 and select the remaining three boys numbered 7, 11 and 15 in the list. Thus the four boys selected in the samples from class 3 are numbered 3,7,11 and 15. Continue the same process to select four boys each from class 4 and 5.
- If the sample is selected from primary school then children of 12 year old should be covered in the household/out of school survey.
- Similar method has to be followed for selection of girls from the school.
- For selected children, then the assessment for goiter has to be done.

Selection of sample of children from the village/ ward (out of school children)

- It is assumed that the children out of the school will be of similar socioeconomic background in the village/ward. For the selection of the sample therefore following two alternative are proposed:
- In the example considered a sample of 27 out of school children from the village/ward has to be selected. This has to be first allocated into various age groups approximately equal. In the present case, it would be five children in the age groups 6,7 & 8 and 6 children in the remaining age groups. Then with a random start in the village, a cluster of children in the specific age groups could be selected by visiting the household next to the random start following right hand rule. The process has to be continued till the sample of required size from different age groups is selected.
- Alternatively the sample required size from different age groups could be selected using systematic sampling if the frame of the household having children in different age groups is available or could be prepared.
- The short fall of children 11-12 year not available in the school should be covered in the household survey.

Selection of random start

- Identify the lane/sub lane gullies, mohallas, tollas etc.
- Select one of these random.
- In the selected lane/sub-lanes, mohallas, etc. out of the houses, select 1 with random sampling. This is the random start for the survey.

Selection of sample of household from the village/ward for salt sample

Every 5th child selected in the earlier steps for goitre survey should be covered for collection of salt samples by visiting the corresponding houses.

Selection of the sample of children from the village/ward for Urine Iodine Excretion (UIE)

For UIE every alternate child out of those selected earlier step for salt sample has to be taken for collection of sample.

Table 20.4 Progress in salt production in India

Indicator	Goal
Salt Iodisation Proportion of Households consuming adequately iodised salt	>90%
Urinary Iodine Median in the general population Median in pregnant	 100-199 ug/L 150-249 ug/L
Programmatic Indicators Attainment of indicators	At least 8 of 10

Techniques of Examination

- From the clinical point of view, the diagnosis of goiter is based entirely on inspection and palpation of the neck. The position taken by the examiner in relation to the person being examined is a matter of personal choice. Some workers face the subject and usually palpate the isthmus and lobes with two thumbs, the fingers of both hands being spread around the lateral side of the neck. Other workers stand at one side of the subjects, the side depending on whether they are right handed or left handed. The palpation is done with the first or the first and second fingers. The examiner should be so positioned that his eyes are approximately at the level of the subject's neck. This means that in case of young children, the examiner must be seated. When assessing the visibility of an enlarged gland it is important that the subject keeps the head steady so that the eyes and the external aural meatus are on plane.
- To assist in palpation, it is frequently desirable to depress the subject's chin to relax the neck muscles. At the commencement of palpation, the isthmus should first be located and then the thumbs or fingers should move laterally to identify the lobes and assess their size.
- In people with a short neck, a part or the whole thyroid gland may be hidden by the sternum; this occasionally makes diagnosis difficult.
- Nodules should be noted and recorded separately.

IDDCP in 12thFive year plan (2012-17)

Goals

Universal use of iodine fortified salt

- To bring down prevalence of IDD below 5% in the entire country by 2017 AD.
- To ensure 100% consumption of adequately iodated salt (15 PPM) at the household level.

To achieve the same, following indicators are given below:

Strategies

- IDD Surveys
- Establishment of IDD Control Cells
- Establishment of IDD Monitoring labs
- Training Programme
- Production and distribution of iodated salt
- Health Education and Publicity
- Community level iodated salt testing
- Incentive to ASHA for Community level awareness of iodated salt
- Strengthening of Central IDD Control Cell
- Health education and publicity by the State/UT's Health Directorate

COMMENTS

1. Universal iodization of salt has not been achieved even after a decade has passed away when the target was set to be achieved. Now in 10th Plan and program have set target of achieving universalization of iodized salt, which is difficult to achieve if state governments are not serious about it. Finally the ministry has notified the ban on sale of uniodized salt in the country. Like failure of any other legislation and restrictions this ban may also likely to be failed till special efforts are made.

   In a multinational household survey it was found that overall, the coverage of adequately iodized household salt increased over the last decade. However, the changes varied widely among countries. The goal of universal salt iodization is still distant for many countries and requires renewed efforts by governments, bilateral and multilateral agencies and civil society.
2. More strengthening of transportation of iodized salt by railways and roads is needed. Monitoring during transportation is usually not done regularly.
3. Boosting up of political and bureaucratic commitment is required as the problem of visible goiter has been reduced so they do not understand the severity of invisible problem.
4. There is a difference in guidelines for assessment of IDD issued by Indian government and international organizations, e.g., India included all

age group for assessing iodine deficiency that may be biased due to the multinodular goitre which is not affected by iodized salt intervention and may give rise the wrong prevalence. International organizations have included 6-12 years age group which is more responsive to the iodized salt program.

5. There is a resistance for the consumption of iodized salt among elite and high section of society. In some tribal areas the goitre rates are still high despite good coverage with the program. These issues should be studied in detail qualitatively. Research is also required for streamlining of MIS implementation and other operational issues.
6. In one of the studies on coverage it was found that only 60% of the households in urban slum in Orissa were using adequate iodized salt (Panigrahi et al 2009). In another study of Kapil U et al 2014 it was found that Udham Singh Nagar the 53% of the salt was iodined with 15ppm and more. In another report it was stated that 40% of the people still purchase non-iodized salt due to various reasons and one of the major reasons is cost of iodized salt manufactured by big industries. Retailers selling the non-iodized crystalline salts. Such practices should be stopped. People should be told about how to make iodized salt at small scale and how to test it. Simpler ways of testing iodine in salt, like lemon test, should also be disseminated to the general public (Neogi 2005).
6. Low funding of the program as compare to other national programs is also bottleneck in proper implementation.
7. Government Budgeting on NIDDCP is not based on scientific and evidence based data.
8. Following studies indicate that the Prevalence rate of goiter has not gone down in spite of existence of program for more than 4 decades:

Area	*Population*	*Year*	*Prevalence*
Udupi (KA)	8-10 yr	2002	30%
MP (Jabalpur)	6-15 yr	2001	2.4%
Kolkata (WB)	-	2005	38.8%
Belgaum (KA)	-	1997	2.5%
Gauhati (A)	13-18 yr	1998	37.3%
Lucknow (UP)	-	1987	20.3%
Sikkim	-	1987	54%
Belgaum (KA)	-	2009	16.6%

In a recent study it was reported that average prevalence rate of hypothyroidsim in major cities of India is 10.95%. It is as high as 21.67% in Kolkata and 11.07% in Delhi whereas Goa reported 7.04% (Unnikrishnan AG et al 2013). In spite of universal iodisation of salt prevalence rate is hypothyriodism is not coming down suggests other environmental or genetic factors playing role in its causation (Kalra S et al. 2011).

WORLD HEALTH ASSEMBLY: 52TH RESOLUTION

Prevention and Control of Iodine Deficiency Disorders

WHO is concerned about iodine deficiency that remains a major threat to the health and development of populations worldwide and that it may result in goitre, stillbirth and miscarriage, neonatal and juvenile thyroid deficiency, dwarfism, brain damage, intellectual impairment, deaf mutism, spastic weakness and paralysis, as well as lesser degree of loss of physical and mental function. Recognizing that the elimination of iodine deficiency will therefore be a great achievement to the world economic development.

WHO calls for preventive and control of Iodine Deficiency in the world by all Governments, international organizations, bilateral agencies and non-governmental organizations in particular the International Council for Control of Iodine Deficiency Disorders (ICCIDD), on their support in the struggle to eliminate iodine deficiency disorders throughout the world, and on the progress to which they have contributed over the last decade to prevent and control iodine deficiency at global, regional and national levels.

The salt industry are requested for its collaboration and key role in making iodized salt available to populations at risk of iodine deficiency, and for its initiative in highlighting iodization of salt at international forums.

References

Benoist B de, Clergston G. Eliminating Iodine deficiency Disorders (Editorial). Bull WHO 2002; 80 (5): 34-1.

Govt. of India. Current Status of National Iodine Deficiency Disorder Control Program (Draft), Ministry of Health & Family Welfare, New Delhi, 1997.

Govt. of India. Revised Policy Guidelines On National Iodine Deficiency Disorders Control Program. Ministry of Health

& Family Welfare. Government of India, October 2006
Govt of India. National Iodine Deficiency disorder control programme, Annual Report (2012-2013). M/o H & FW.
Haddow et al. NEJM 1999; 341: 549-555.
Jayashree S, Naik DK. Iodine losses in iodized salt following different storage methods. Ind J Pediatric 2000; 67 (8): 559-61.
Kalra S et al. Thyroidology & Public Health: The Challenges ahead. ind J Endoc & Metab 2011; 15(3): 73-5.
Kapil U. National Iodine deficiency Disorder Control Program. The Antiseptic 2002; 99 (6): 209-213.
Kapil U, Pandey RM, Jain V, Kabra M, Sareen N, Bhadoria AS. Status of iodine defi ciency disorder in district Udham Singh Nagar, Uttarakhand state India. Indian J Endocr Metab 2014;18:419-21.
Kishore J. A Dictionary of Public Health. New Delhi: Century Publications 2013.
Neogi SK. Popularizing iodized salt (letter). Down to Earth 2005; Feb, page 3.
Pandav CS. International Council for Iodine Deficiency Disorder (Panel discussion) Bull WHO 2002; 80 (5):
Pandav CS. Research – Policy-Program Science-Stateman-Societ (Pie Oration). XXXII Annual National Conference of Indian Association of Preventive & Social Medicine 17-19 Feb 2005.
Pandav CS et al 2013), Yadav K, Srivastava R, Pandav R, Karmarkar MG. Iodine deficiency disorders (IDD) control in India. Indian J Med Res. 2013 Sep; 138(3): 418–433.
Panigrahi A, et al. Status of iodized salt coverage in urban slums of Cuttack city, Orissa. Ind J Com Med 2009; 34: 145-147.
Planning Commission. 10th Five Year Plan (2002-2007) Vol-II Sectoral Policies and Programs Nutrition. Govt. Of India, New Delhi.
Tran TD et al. Access to iodized salt in 11 low- and lower-middle-income countries: 2000 and 2010. *Bull World Health Organ* 2016;94:122–129
Unnikrishnan AG et al. Prevalence of hypothyroidism in Adults: an epidemiological study in eight cities of India. Ind J Endo & Meta 2013; 17(4): 647-652.
Utiger RD. NEJM 1999; 341: 601.
World Health Assembly. Prevention and Control of Iodine Deficiency Disorders (52.24) Resolution, WHO 1999.

CHAPTER 21

NATIONAL MENTAL HEALTH PROGRAM

INTRODUCTION

Mental Disorders are defined as "Clinically significant behavioral or psychological syndrome or pattern that occurs in an individual and is associated with present distress (e.g., painful symptoms), or disability (i.e., impairment in one or more important areas of functioning) or with a significantly increased risk of suffering, death, pain, disability or an important loss of freedom. In addition, this syndrome or pattern must not merely be an expectable and culturally sanctioned response to a particular event, e.g. the death of a loved one. Whatever is its original cause, it must currently be considered a manifestation of a behavioral, psychological, or biological dysfunction in the individual. Neither deviant behavior (e.g. political, religious, or sexual) nor conflicts that are primarily between the individual and society are mental disorders unless the deviance or conflict is a symptom of a dysfunction in the individual, as described above (Kishore 2013). This definition highlights the importance of thorough investigations and a battery of tests before labeling someone as psychiatrically ill. There are two widely used classification systems namely International Classification of Disease (ICD-10 version) and Diagnostic and Statistical Manual of Mental Disorder (DSM IV Revision), which define various criteria for individual mental disorder.

Mental health is not just an absence of mental disorders. It is defined as a state of wellbeing in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community (WHO 2007). The focus should be on promoting mental health throughout the life span to ensure a healthy start in life for children and to prevent mental disorders in adulthood and old age.

Determinants of mental health are: multiple social, psychological and biological factors that determine the level of mental health of a person at any point of time. For example, persistent socioeconomic pressures are recognized risks to mental health for individuals and communities. The clearest evidence is associated with indicators of poverty, including low levels of education. Poor mental health is also associated with rapid social change, stressful work conditions, gender discrimination, social exclusion, unhealthy life style, risks of violence, physical ill health and human rights isolation. There are also specific psychosocial and personality factors that make people vulnerable. Lastly biological causes include genetic factors and imbalances in chemicals in brain.

Mental disorders are always neglected due to its non-specificity in diagnosis, vague clinical presentations, long term and varied treatment, and various myths and belief systems leading to social stigma. In the earlier times peculiar behavior was dealt with three major ways: a) downright inhuman and cruel; b) human but nonmedical and c) healing procedures, precedents of modern psychiatry. In the Indian system of medicine

Mental health is a vitally important aspect of public health that has long been segregated and neglected and should move into the mainstream of health policy and practice. Psychiatric symptoms are common in general population all over the world. Worry, tiredness, and sleeplessness affect more than half of the adults at same time, while as many as one person in seven experiences some form of diagnosable neurotic disorder.

BURDEN OF DISEASE

The World Bank report revealed that the Disability Adjusted Life Year (DALY) loss due to psychiatric disorders including substance use is 11.5% which is much higher than diarrhea, malaria, worm infestations, HIV and tuberculosis if taken individually. According to the estimates, DALYs loss due to mental disorders are expected to constitute 15% of the global burden of diseases by 2020 (World Health Report 1999).

The WHO study of mental disorders in general health care in 14 countries worldwide found that a quarter had well defined disorders, and a further 9% had sub-threshold conditions. The most common disorders were depression (10%), generalized anxiety disorder (8%), and harmful use of alcohol (3%). Mental disorders such as depression, alcohol use disorders and psychosis (schizophrenia and bipolar depression) are among the top 20 leading cause of disability. Disability due to mental disorders is more common in 0-59 years. They are an important source of lost years of healthy life for women aged 15-44 years. They make up 3 of the 10 leading causes of disease burden in Lower income and Middle income countries and 4 of the 10 leading causes in high income countries.

Neuro-psychiatry disorders cause one third of YLD among adults aged 15 years and over:

	YLD in million (%)	
Cause	***Male***	***Female***
1. Unipolar Disorders	24.3 (8.3)	41.0 (13.4)
2. Alcohol Use Disorder	19.9 (6.8)	-
3. Schizophrenia	8.3 (2.3)	8 (2.6)
4. Bipolar Disorders	7.3 (2.5)	7.1 (2.3)

Depression is the leading cause in both the countries followed by self-inflicted injuries at 9th place among female. Depression is the 3rd leading cause of moderate and severe disability. According to the world mental health surveys 2011, the lifetime prevalence of a major depressive episode is 14.6% in high income and 11.1% in low to middle income countries.

In Sri Lanka, 600,000 people or 3% of the population suffer from some kind of mental disorder. More than three decades of conflict and effects of tsunami are having a huge impact on the mental well-being of the Sri Lankan population, on its most deprived sector in particular, a WHO report said.

During the last two decades, many epidemiological studies have been conducted in India, which show that the prevalence of major psychiatric disorders is about the same all over the world. The prevalence reported from these studies (Table 21.1) range from 18 to 207 per 1000 population with the median 65.4 per 1000 population (Ganguli 2000, Murali 2001) and at any given time, about 2-3% of the population, suffer from seriously, incapacitating mental disorders or epilepsy (Dube 1970; Kapur 1973, Sethi 1972). Most of these patients live in rural areas away from any modern mental health facilities.

With around 13 crore Indians suffering from some form of mental illness - depression and anxiety syndromes to psychosomatic disorders and schizophrenia. As many as 1.2 lakh people in India commit suicide every year. Majority of them were suffering from mental disorders. Besides that, more than four lakh people attempt to commit suicide. 60% of the deaths caused by suicide can be prevented with proper counselling. However, suicide is 16th leading cause of death (Global Burden of Disease 2008).

In one study the psychiatric morbidity was 40% detected on screening with self reporting version of Primary Care Evaluation of Mental Disorders (PRIME-MD); the commoner disorders were somatoform (35%), depressive (34%), 29% panic, 30% anxiety, 4% bulimia, and 6.5% alcohol abuse (Barua et al 2007). A large number of the adult patients (10.4%-53%) coming to the general OPD are diagnosed mentally ill. However, these patients are usually missed because either medical officer or general practitioner at the primary health care units does not ask detailed mental health history. Due to missed diagnosis of these patients, unnecessary investigations and treatments are offered which heavily

cost the health providers and the community (Kishore 1996). List of causal factors of psychiatric disorders are given in Table 21.2.

Mortality caused by neuropsychiatric disorders is 2.2% in females and 2.1% in males.

Alzheimer Disease

More than 26 million people worldwide have Alzheimer's disease and this number will quadruple by 2050, with the biggest part of that expected in Asia. At this rate, one in 85 people will have the brain-destroying disease in 40 years. With such huge burden projections India needs to plan in advance.

Alcohol and substance abuse

According to estimates made by the World Health Report at least ten thousand million people throughout the world regularly use alcohol and about 13.5 million people use opioids (WHO 2002). In India, the problem is slowly increasing and it is estimated that 75 million people are alcohol users and nearly 3 million are opioid users, of which a majority require medical treatment and rehabilitation (Srivastava 2002).

Suicides

Suicides took place every hour. More than one lakh persons (1,34,599) in the country lost their lives by committing suicide during the year 2010. It is observed that social and economic causes have led most of the males to commit suicides whereas emotional and personal causes have mainly driven females to end their lives. Suicides because of 'Family Problems' (23.7%) and 'Illness' (21.0%) combined accounted for 44.7% of total Suicides. The percentage of suicides due to 'Property Dispute' and 'Death of dear person' showed a relatively higher increase of 48.0% and 28.9% respectively.

The overall male:female ratio of suicide victims for the year 2009 was 65:35, however,the proportion of Boys : Girls suicide victims (upto 14 years of age) was 52:48. Nearly 70.5% of the suicide victims were married males while 67.0% were married females (NCRB 2010).

Strategies for prevention of Mental disorders

1. Early childhood intervention (for example, home visit for antenatal visits, pre-school psychosocial activities, combined nutritional and psychosocial health for disadvantaged population.
2. Support to children, for example skill building program, child and youth development program.
3. Socio-economic empowerment of females: improving access to education and microcredit scheme.
4. Social support for elderly population (befriending initiative, community and day care centers for aged).
5. Program targeted at vulnerable groups (for example, psychosocial intervention after disasters)
6. Mental health promotional activities in school.
7. Mental health intervention at work (e.g., stress prevention program).
8. Housing policies (housing improvement).
9. Violence prevention (community policing initiatives)
10. Community development program.

Mental health promotion involves actions to create living conditions and environment that support mental health and allow people to adopt and maintain healthy lifestyles. A climate that respects and protects basic civil, political, socioeconomic and cultural rights is fundamental to mental health promotion. It also requires mainstreaming mental health promotion into policies and programs of government and sectors including education, labor, justice, transport, environment, housing, social welfare and health.

Challenges

Besides limited number of psychiatrists and beds there are other challenges such as limited investment in health by the government (estimated public sector expenditure on health is only 17 % of total health expenditure), problems of poverty (about 30% of population lives below poverty line) and low literacy with associated stigma and discrimination for persons with mental disorders.

Human Rights of Mentally ill

"All persons with a mental illness, or who are being treated as such persons, shall be treated with humanity and respect for the inherent dignity of the human person... There shall be no discrimination on the grounds of mental illness..." (UN 1991).

NATIONAL MENTAL HEALTH PROGRAM

The Government of India has launched the National Mental Health Program (NMHP) in 1982, keeping in

view the heavy burden of mental illness in the community, and the absolute inadequacy of mental health care infrastructure in the country to deal with it. The Program envisages a primary health care community based approach in the rural areas supported by professional psychiatric supervision from the district level and referral services by the mental hospitals and mental health units of the general hospitals.

Aims

1. Prevention and treatment of mental and neurological disorders and their associated disabilities.
2. Use of mental health technology to improve general health services.
3. Application of mental health principles in total national development to improve quality of life.

Objectives

1. To ensure availability and accessibility of minimum mental health care for all in the foreseeable future, particularly to the most vulnerable and underprivileged sections of population.
2. To encourage application of mental health knowledge in general health care and in social development.
3. To promote community participation in the mental health services development and to stimulate efforts towards self-help in the community.

Strategies

1. Integrating mental health with primary health care through the NMHP;
2. Provision of tertiary care institutions for treatment of mental disorders;
3. Eradicating stigmatization of mentally ill patients and protecting their rights through regulatory institutions like the Central Mental Health Authority and State Mental health Authority.

Mental health care

1. *The Mental Morbidity requires priority in Health Care Delivery and Treatment*

Acute mental disorders of varying etiology like acute psychosis, paranoid reactions, psychoses associated with cerebral involvement as in communicable diseases like malaria, typhoid, meningitis, alcohol psychosis and epileptic psychosis resulting in temporary disability can be treated.

Modern treatment of schizophrenia, dementia and encephalopathy reduce disability to a great extent. Emotional illnesses are often associated with physical disease and these patients do seek help at the general health services. Proper recognition and treatment is very important to reduce the morbidity in the community.

2. *Primary Health Care at Village and Subcenter level*

Multi-Purpose Worker (MPW) and health supervisor will be trained to deal with management of psychiatric emergencies, maintenance of treatment advised from the higher center, management of grand mal epilepsy through utilization of appropriate medicine under the guidance of a medical doctor and liaison with the local school teacher and parents in matters concerning the management of children with mental retardation and behavior problems and counseling of patients suffering from alcohol and drug use disorders.

3. *At Primary Health Center level*

Medical officers will be trained to provide the following services:

a. Supervision of the MPWs and health supervisors,
b. Producing mental diagnosis with the help of flow charts and neurological examination,
c. Treatment of mental disorders that can be managed at PHC, and
d. Epidemiological surveillance of mental disorders in the area along with planning and implementation of Program for the same.

4. *At the District Hospital level*

There is an urgent need for psychiatric speciality to be attached to every district hospital with a strength of 30-50 beds as an integral part of the district health services. There should be a provision of admission and treatment of all kinds of mental disorders, ECT, and further referral services.

5. *Mental Hospital and teaching Psychiatric Units*

These higher centers of psychiatric care will actively and dynamically function with links to the periphery. This calls for a change in the role of the psychiatrist from a clinical specialist to a leader and planner of mental health services in his territory.

It is estimated that there are about 37 mental hospitals run by states in India. In addition there are about 40-

50 psychiatric wings in a number of medical colleges with approximately 25000 to 30000 beds.

DISTRICT MENTAL HEALTH PROGRAM
(According to 11th Five Year Plan)

It was interesting note that mental health care was largely confined to mental hospitals till about 50 years. Change in approach to care occurred on the background of several observations that include scientifically proven efficacy of treatment, safety of medications, high cost of care in mental hospitals, poor quality of life of persons treated in institutions, demonstration of feasibility of care in the community and lastly health care being recognized as the right of the individual. Against this background, some developments occurred in India, which made it possible, to apply community-based models for mental health care. The district of Bellary in Karnataka was the first district where mental health care program for the population of district was pilot tested by NIMHANS between 1986- 1995. It was found that mental health delivery was possible in primary care settings. Primary care physicians can be trained in such a care. Provision of supervision and support from the program officer and / or the psychiatrist empowers the public health care system to respond to the needs of the population.

This model of DMHP was implemented in 27 Districts of the country in 1996. A team of experts from the National Institute of Mental Health and Neurosciences (NIMHANS) evaluated the DMHP in the year 2003. Evaluation revealed the following observations.

* Mental Health Care is available in many States at the District level in the country due to implementation of DMHP.
* Minimum range of essential drugs was available at the district level in adequate quantities while that of the primary health center and *taluk* hospital varied. The procurement was delayed due to various procedural problems.
* Most of the centers had given training to doctors in mental health care. However, the duration of training and the number of doctors trained varied.
* Some centers had good records while others were poor. Registration of cases and reporting format was not uniform across the centers.
* Some centers had developed their own material for public education, while others were using the ones provided. IEC activities were not uniform across all the centers.
* Nearly 50% of the DMHP sites had organized mental health care in the district hospital, including inpatient care, though the number of clinic days varied from one center to the other. Evidence suggested that the number of persons using district mental health clinic had increased as time passed by.
* Mental health care in primary health centers and at the *taluk* level was seen in some districts and the number of patients seen in the periphery varied from few patients to over thousands.

Objectives

1. To provide sustainable basic mental health services to the community and to integrate these with other services.
2. Early detection and treatment of patients in the community itself.
3. To see that the patients and their relatives do not have to travel long distances to go to hospitals or nursing homes in cities.
4. To take pressure off mental hospital: To ease the pressure in mental hospitals by providing mental health care at primary level only.
5. To reduce the stigma attached towards mental illness through change in attitude and public education.
6. To treat and rehabilitate mental patients discharged from the mental hospital within the community. This step involves educating the family about mental illness and need for regular medication at home and strengthening the family support system.
7. To detect, manage, and suitably refer cases of epilepsy and ensure availability of anti-epileptic drugs and others so as to reduce stigma towards epilepsy.

Components of DMHP

1. Expansion of the DMHP to 500 districts all over the country with some modifications. The cost of DMHP may be increased to 1.60 crores per district.
2. Improvement of Health manpower: The manpower development schemes under the DMHP in the IXth plan included establishing Centers of Excellence under scheme A for which a grant of upto 30 crore is available for each centre. These centers have timelines for initiating/increasing

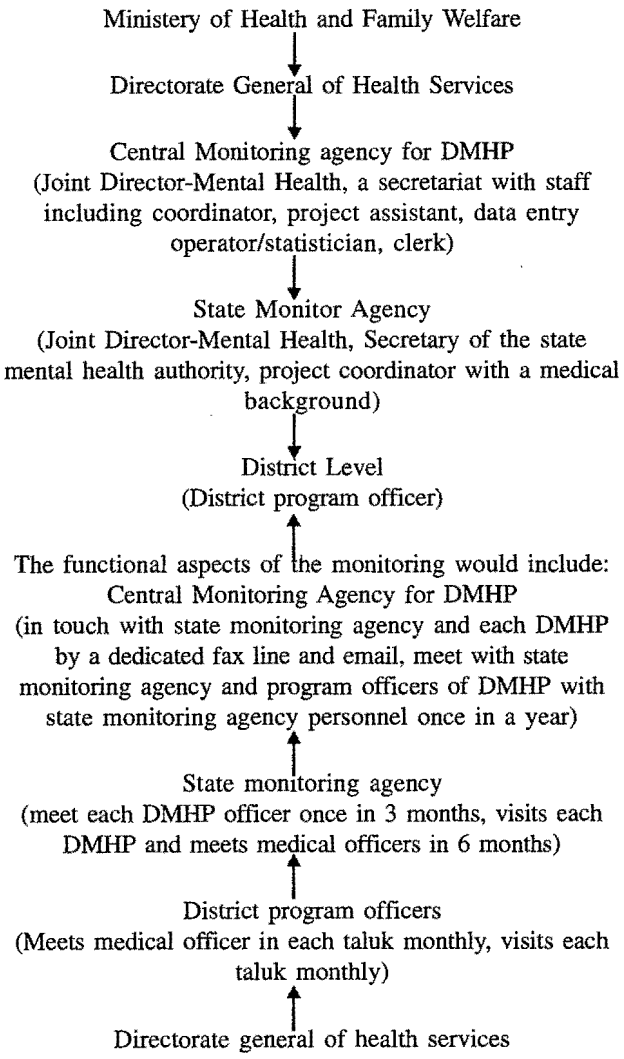
courses in psychiatry, psychiatric nursing, psychiatric social work and clinical psychology.

The scheme B is strengthening PG training departments of mental health specialties for which a support of 51 lakhs to 1 crore per PG department is available. It is proposed to facilities 50 MD seats, 25 DPM seats in the teaching colleges and to train 5000 *taluk* level medical doctors for a period of 6 months to 1 year as a part of a certificate course (Haq MZU et al 2008). Provision of staff and equipment for ten beds for acute care in the district hospital.

Appointment of the program officer in every district Medical Officer with at least 5 years experience who will receive training for six months to work as program officer after three months training in mental health care, education and supervisory skills. The training will be in two phases each of three months separated by one year.

3. Availability of outsourced vehicle for mobility of the DMHP team (mobility refers to field visits by the psychiatrist and the district family welfare officer or the program officer to the primary health centers and primary health units in the district and *taluk* level hospitals.
4. Availability of all the essential drugs in every primary health center and primary health unit.
5. The District Hospital will have higher drugs like Olanzepine, Lithium Carbonate and Carbamazepine. This is in addition to the essential drugs to facilitate higher level of care for patients referred from the primary health care institutions.
6. IEC activities in the entire district. A budget of Rs. 25 crores has been proposed for this area.
7. Health promotion using Life skills approach in the schools
8. Training program for the Medical Officers and the Paramedical staff at the district headquarters by the psychiatrist and the program officer as the case may be.
9. Monitoring, support and supervision – Visits to the PHC/PHU by the psychiatrist or the program officer as the case may be, at least once a month. Monthly review of the mental health program at the district level.
10. Support money for implementing of Mental Health Act and running the mental health authorities is proposed at Rs. 10 crores.
11. School Mental Health Program to be implemented by imparting life skills education using teachers as trained resource staff. It is planned that the schemes is implemented at a rate 100 districts each year making a total of 500 districts to be covered in 11 plan.
12. Non-governmental agencies have an important role to play. A sum of Rs. 20 lakhs may be given for them to organize camps educate public, etc.
13. College counseling services, workplace stress management and suicide prevention services are the new components proposed in the revised IXth plan.

Monitoring of the DMHP


Ministery of Health and Family Welfare
Directorate General of Health Services
Central Monitoring agency for DMHP
(Joint Director-Mental Health, a secretariat with staff including coordinator, project assistant, data entry operator/statistician, clerk)
State Monitor Agency
(Joint Director-Mental Health, Secretary of the state mental health authority, project coordinator with a medical background)
District Level
(District program officer)
The functional aspects of the monitoring would include:
Central Monitoring Agency for DMHP
(in touch with state monitoring agency and each DMHP by a dedicated fax line and email, meet with state monitoring agency and program officers of DMHP with state monitoring agency personnel once in a year)
State monitoring agency
(meet each DMHP officer once in 3 months, visits each DMHP and meets medical officers in 6 months)
District program officers
(Meets medical officer in each taluk monthly, visits each taluk monthly)
Directorate general of health services

Current Status of DMHP in India

The district mental health program (DMHP) is also being started in 325 new districts. At present, the program is in place in only 123 districts. The central grant for implementation of DMHP per district with an average population of 20 lakh for five years will be Rs 2.5 crore.

Most of the centers have trained doctors, health workers and other paramedical workers. The program officer is a Psychiatrist in many of the DMHP states. This is a very positive development. However their involvement is strengthening clinical services rather than providing support to the primary health care team. PHCs are providing referral to patients to district where psychiatrist is visiting rather than handling their problem then and there only. The State of Karnataka has an officer-designated Deputy Director mental health who is a psychiatrist and responsible for monitoring the progress in implementation of DMHP but such arrangement is not extended to other states. Mental health care program in India is progressing very slowly.

Barriers in implementation of DMHP

Barriers in implementation of District Mental Health program has been identified and listed below:

1. Administrative Barriers

Some centers did not submit the utilization certificate and that contributed for the delay. Release of funds for the program by the state government was reported to be a problem in some centers. Clear guidelines to operate fund is not given. The fund for some items is not sufficient. Several centers faced problems in recruiting personnel. Recruitment rules, minimum qualifications, rules regarding reservation, availability of person with required qualification, frequent turnover of the staff due to transfers were reported as major bottlenecks in availing the services of prescribed number of staff for whom funding was provided. Some centers are facing problems in getting drugs. Timely release of drugs to PHCs is very critical. Lack of coordination between paramedical workers, medical officer, program officer, District Health Officer and other State level officers is a major issue in most of the states. Lack of coordination results in delay in starting the training program, operation of accounts, purchase of drugs and stationary for the program. Poor motivation, lack of commitment, lack of support from the local Government, access to funds and lack of monitoring from the Central Government are other impending factors.

Lack of manpower resources

- Non-availability of staff like psychiatrist, psychologist and social workers.
- Lack of time/interest for the psychiatrist in the program.
- Temporary nature of the job often is an impeding factor for professionals to join the DMHP.
- Lack of commitment on continuation of service is a major barrier to recruit personnel

Motivational barriers

- Poor pay scales does not motivate the workers to work in DMHP.
- Need for case record maintenance is overlooked.
- Some programs have appointed doctors on contract basis. These doctors do not have any administrative control over paramedical workers attached to PHC/PHU. This is demotivating for the doctors.
- Unfilled vacancies in the primary health center lead to transfer of work to the rest.
- Untimely staff transfers

General Issues

- Doctors are often poor leaders and this undermines their role as the head of primary care team.
- A frequent interpersonal problem between the doctor and the paramedical staff breaks down communication and this seriously hampers efficiency.
- Doctors spend lot of time in curative and outpatient work. Their attention to national program therefore suffers. They are unable to delineate roles specific to each one of the personnel and supervise their work because of demand on their professional time. Private practice of doctors reduces their availability for hospital work. Implementation of the DMHP is a collective responsibility of officials in the state government. The Government of India provides funds to the state to initiate DMHP. The process of implementation can confront many barriers. Guidelines, operational procedures can be of some use but bureaucratic hurdles can be removed by appropriate instructions. The States should consider availability of funds as an opportunity to develop

mental health care rather than considering it merely an obligation to complete the ritual of implementation of DMHP. Many senior administrators in DHS are not aware of the program and do not discuss it in their review meetings.

The National Human Rights Commission also monitors the conditions in the mental hospitals along with the government of India and the states are currently acting on the recommendation of the joint studies conducted to ensure quality in delivery of mental care.

School Mental Health program

The national mental health program for India in the eleventh five-year plan envisages health promotion using life skills approach for adolescents by institutionalizing life skills education in the schools (Sagar & Kishore 2007). In 2010, this program has been sanctioned to be implemented in all the DMHP districts in the country.

Evidence suggests that attention to problems of children in the early stages can prevent long-term consequences. Resources for care of children in the community involve utilization of parents, NGOs and other resources available in the community (e.g. schools). A district mental health team will facilitates this program.

Health Promotion through Life Skills Education

The Secondary Schools' Educational System is an important stakeholder in the Health Promotion of adolescents. The education, currently prevalent in India places stress on acquiring information, knowledge and technical skills rather than psychosocial competence and realizing one's potentials. It is achievement oriented than child centered. It does not address the needs of all the children/adolescents who in spite of various levels of scholastic competence are capable of learning and need to develop those abilities/ skills, which are needed to live an effective and Healthy Life in this world. Life Skills Approach (LSA) on the other hand promotes **empowerment of the adolescent**. This empowerment is very essential in today's context in India as there is rapid globalization and urbanization with breaking up of joint families and the traditional support systems. There is growing evidence of increased rates of adolescent behavior problems and suicides. Crime, violence, sexual permissiveness, drug abuse, academic competition and school dropout are on the rise among the youth. Existing issues like poor literacy among youth, child labor also need attention. An empowered adolescent has the competence to cope with the challenges of life using the available resources even amidst such adversities. The World Health Organization has been promoting the Life Skills Program as a way of addressing this health need in a growth oriented manner.

Methods to improve the psychosocial competence and resilience of the adolescent as health promotional activities need to be included in the school syllabus as a co-curricular activity. Life Skills Education (LSE) is one such program that can be used as a base for various health promotional activities like Prevention of Tobacco/ other Drug Use, Teenage Pregnancy, dealing with Violence etc.

Life Skills (LS) are abilities for adaptive and positive behavior that enable individuals to deal effectively with the demands, challenges and stress of every day life. These are skills, which help an individual to live effectively, in situations of stress and they are learned implicitly. This process if taught explicitly in a structured manner in schools, it would be a major step in empowering the adolescents and addressing the quality of the adults tomorrow.

Life Skill Education

Life Skills Education is a novel promotional program that teaches generic Life Skills through Participatory Learning Methods of games, debates, role-plays, and group discussion. Conceptual understanding and practicing of the skills occurs through experiential learning in a nonthreatening setting. Such initiatives provide the individual with a wide range of alternative and creative ways of solving problems pertaining to various health and psychosocial issues like Drug Use, Sexual Abuse, Teenage Pregnancy, Early Sexual Experimentation and Bullying. Repeated practicing of these skills leads to a certain mastery and application of such skills to real life situation and gain control over the situation. It is a promotional program, which improves the positive health and self-esteem.

The **Life Skills**, which need to be taught at the schools level especially to adolescents as are:

* Critical Thinking & Creative Thinking
* Decision Making & Problem Solving
* Communication Skills & Interpersonal Relations
* Coping with Emotions & Stress
* Self Awareness & Empathy

These skills could be used by the adolescent for any problem – be it health or psychosocial competence depending upon the situation

Life skills education was implemented in four districts in Karnataka on a pilot basis. Haveri, rural and urban Bangalore, and Udupi districts were taken up for implementation of life skills education in active collaboration with department of education. The key resource team was from NIMHANS.

Improvement in Health Manpower Development

There is an acute crisis as regards mental health professionals; psychiatrists in particular have dwindled in numbers. Of the 3,300 trained psychiatrists in the country, 3,000 are in the four metros. However, India actually needs approximately 32,000 psychiatrists for a population of 1.2 billion. Compared to a developed country (e.g. UK) the number of psychiatrist available per unit population in our country is 30 folds fewer. Even with a modest standard of one psychiatrist per lakh population we will not have enough professionals for several years to come. There is hence an urgent need to generate adequate number of health manpower in psychiatry.

The ministry has proposed upgradation of 29 existing mental health hospitals, increase of at least 44 postgraduate seats in psychiatry, 176 MPhil seats in clinical psychology and 220 seats for psychiatric nursing each year. The ministry envisages that 616 qualified mental health professionals would be produced from these centres every year once they are set up. This number is still not sufficient. More MD and DPM seats are required. In addition, there is a need to train 5000 *taluk* level medical doctors for a period of 6 months to 1 year as a part of a certificate course. Medical colleges may use the mental hospitals in their state / district to develop training programs as well as seek financial support that may include staff under the infrastructure.

Uptil now grant has been released for up gradation of psychiatric wings of 88 medical colleges/general hospitals out of which 23 departments have been established to increase post graduate psychiatry training. The ministry has also proposed setting up and strengthening of 30 departments of clinical psychiatry, 30 departments of psychiatric social worker (PSW) and 30 departments of psychiatric nursing. 10 centres of excellence have also been established across the country during the 11th plan period.

The proposed budget for the program in the 11th Plan is Rs 623 crore, which is higher compared to the 139 crores allocated in the 10th plan. According to plan, the ministry will give basic mental health training to doctors at the primary healthcare centers in the villages. MBBS doctors will also be trained on how to identify and counsel patients with mental health problems at the subdivision and district levels. The other recent activities which have been proposed are been college counseling and workplace stress management. The college counseling program proposes to train the college teachers to serve as counselors for their college students. The training will be conducted in the district headquarters and two teachers per college would be trained. These trained teachers would then organize sensitization sessions for their colleagues and officially launch the counseling centre.

The workplace stress management activities have been proposed with the objective to encourage the executives to understand the impact of stress on everyday life, to learn skills for stress management and to incorporate specific lifestyle changes to minimize damage due to stress. This program would involve activities such as games, role plays, brain storming sessions, group discussions and practical skills such as relaxation, yoga, breathing exercise, communication and assertiveness. The suicide prevention services include establishing counseling center at district level, organizing sensitization workshops, IEC and collaboration with various departments. Activities also include lay counselors and training of police personnel.

Non Governmental Voluntary organization – Role in NMHP

The NGOs have a substantial role to play in the following areas:

- Information, education and communication.

- Support for health promotion using life skills approach.
- Support for follow up of severely mentally patients in the community.
- Support for mentally retarded children and their families- organization of self help groups.
- Organization of mental health camps with the help of elected representatives and volunteers in the community.
- Networking with primary health care team, ASHA workers of rural health mission, and other voluntary agencies in the community.
- Facilitation of disability welfare benefits for the mentally ill and mentally challenged persons in the community.
- Home care for the severely mentally person who are unable to use outpatients services in the primary health centers.
- Organizing street plays to disseminate information that mental illness is treatable in primary health centers. They can function like any other person with adequate treatment.

COMMENTS

1. There is no initiative from the mental health professionals to take active part in this program. Most of them are not even aware of the program.
2. There is shortage of qualified psychiatrists and psychologists, notching up the needs of the population. Training programs are not able to meet the demand in providing the required training to all medical private practitioners and medical officers. There is need for training regarding managing of mental illnesses right at the undergraduate level. One of the main challenges is an extremely limited number of mental health professionals and facilities and the very limited mental health service infrastructure.

   Taking the prevalence of 1% serious and 5% minor mental disorders, the country of more than one billion would be having 10,270,165 serious and 51,251,625 minor mental ill patients as per 2001 census. There are only 25,989 psychiatric beds available, 2219 psychiatrists, 843 clinical psychologist, and 290 psychiatric social workers whereas requirement is 9696 psychiatrists (1: 10000), 13,259 clinical psychologists (1:1.5:10,000) and 19,064 psychiatric social workers (2:10,000).
3. Appropriate mental health services can be provided at the subcenter and village level by minimum training of the health workers that will help in providing comprehensive health care at the most peripheral level (Kishore 1996). Common mental disorder (CMD) are illnesses present with medically unexplained physical symptoms, depression and anxiety. CMD are amongst the most significant cause of disability in the world. About 1 in 3 adults attending primary or general health care facility suffer from clinically significant CMD. These disorders should be dealt with other disciplines of the medicine and should be taught to undergraduate students (Patel 1997,1998).
4. The targets set for the program are not achieved till today even after being operational for more than a decade. This indicates that there is a poor commitment of the government, psychiatrists, and community at large.
5. The program has given some emphasis on the curative services to the mental disorders and preventive measures are largely ignored. This has promoted quacks, faith healers, unfavorable beliefs. Thus, more public awareness programs are required for the same.
6. The medical care in the psychiatric hospitals are custodial in nature and people are still afraid of seeking help for psychiatric illnesses. This needs to be changed to a therapeutic approach.
7. Mentally retarded person always suffers from social stigma and does not get appropriate management due to ignorant parents and health facilities. Majority of health workers do not know how to handle such patient in their setting.
8. Mental health services are deficient in both rural and urban areas. But according to the National Mental Health Program and District Mental Health Program the focus is more on mental health service in rural areas and completely neglecting mental health care needs of small town and urban slum dwellers. The benefits of modern psychiatry are still not within the reach of urban population (Desai 2001). There is very little information on the mental health service needs, availability, and utilization in urban areas.
9. Need of Community Psychiatry: The involvement of family members in the treatment of the mentally ill by Vidya Sagar at the Amritsar Mental Hospital

in 1950s and then in Rohtak Haryana was the beginning of community psychiatry in India and was promising to handle shortage of staff. Later Community based mental health care centers were started by CIP at Mandar in 1967 and by NIMHANS in 1975. A rural mental health program was started by PGI with the help of WHO in 1980s. Still community psychiatry is in infancy and needs to be nurtured to get the full potential benefits. As the cost of indoor mental health care is increasing many folds, further increase of mental morbidity will be a huge burden on health system and can be better handled at the community level.

9. The National Mental Health Program should be rewritten and reframed after learning from the mistakes during implementation. Mental Health Act is in force and there is a mental health authority at the center as well as at the state level to oversee its implementation and also in setting up proper services. In presence of Consumer Protection Act and Drug Abuse Act the Mental Health Act and program need to be made more operational (Malik 2004).
10. The logical connectivity of policy to program to legislation seems to have been ignored in the mental health scenario of India. There should be a policy formulation and later program and legislation will help in achieving the goal of fulfilling the mental health service gap (Malik 2004).
11. Currently there is no system for annual reporting of mental health data. There is a need to invest resources in developing information monitoring systems which incorporate indicators for the major demographic and socioeconomic determinants of mental health, the mental health status of the general population and those in treatment (diagnosis, age, sex, etc.). Further information regarding burden associated with disability (DALY) data, the extent of burden on caregivers and the financial costs involved are lacking in India which is very important for policy planning.
12. The cost of one psychiatry consultation visit on outpatient basis was Rs 201 (US$2.97) in which the contribution of the health provider was 68% and the patient's contribution was 32%. It was found that of the total cost, 48% was the out of pocket expenditure by the family and cost of drugs only accounted for 17% of the total cost. (Sarma 2006). The cost of management of schizophrenia as compared to diabetes mellitus was not significantly different. The total annual costs of care of schizophrenia were US$274 according to Grover et al (2005). The main brunt of financial burden was borne by the family. Total treatment costs in schizophrenia were significantly higher in those who were unemployed, those who visited the hospital frequently and disabled. In cases where family are poor government needs to support to avoid families falling into poverty (Kukreti P et al 2016).
12. 5% of total budget of health is spent on mental health in France. Such calculation is not available in India (WHO 2001).
13. Various misconceptions particularly about mental illness, psychotherapy, electroconvulsive therapy, and prognosis of disease are prevalent in young medical professionals and remained unchanged over the last one decade. This is detrimental for the positive development of health seeking behavior and treatment (Mukharjee et al 2006). There is a need for development of positive attitude among medical professionals. In other countries the compulsory short duration of posting in psychiatric ward enforces undergraduate medical students and interns to realize the importance of psychiatry. Even though psychiatry posting is compulsory for undergraduate medical students and interns in India as well, the duration of undergraduate training should be increased and made more skill based.
14. Mental health program should also develop linkage between other national programs where mental disorders are common occurence for example, HIV patients have high risk of developing depression (Rupani et al 2015); similarly tuberculosis is common in mentally ill patients and should be treated along with care of mental health.
15. In my personal interaction with a senior professor psychiatrist I was told that the patient can not be interviewed on telephone or internet. I believe that in some situaation we can initiate the consultation before patient can be brought to the psychiatrist. After few years, I have found out that smartphones can be used for various forms of therapeutic interventions enabling more accessible using combinations of data from video, virtual reality, texting, search, geographical information systems and gaming techniques as well as popularize more

commonly available Internet-based cognitive therapies psychoeducation and bibliotherapy (Yellowlees & Chan 2015). Mental health applications (apps) can be categorized in three broad areas. First, apps can serve as a communication medium allowing patients to connect with other patients, caregivers, providers or other forms of social support. Second, apps can serve as an extension of traditional in-person practice and augment psychotherapy, medication management and other mental health interventions with journaling, symptom tracking tools, self-monitoring and psychoeducation between appointments. Third, these can act as a smart monitor using tools that may automatically predict relapse, worsened symptoms or changed activity (Chan S et al 2015).

MENTAL RETARDATION

Under Section 84 of the Indian Penal Code, a person is not liable to be prosecuted if they are of unsound mind (idiots, the very ill, lunatics and drunks), or incapable of comprehending the nature of the criminal act and the fact that it is against the law.

An idiot is one who is of non-sane memory from his birth, by a perpetual infirmity without lucid intervals: and those are said to be idiots who cannot count 20, or tell the days of the week or who do not know their fathers or mothers or the like (Dhananjay Mahapatra. Supreme Court defines who's an idiot. TNN 31 Aug 2008, 0128 hrs IST).

DECLARATION ON THE RIGHTS OF MENTALLY RETARDED PERSONS

The United Nations and all associated bodies are emphasizing that the Declaration on Social Progress and Development has proclaimed the necessity of protecting the rights and ensuring the welfare and rehabilitation of the physically and mentally disadvantaged, bearing in mind the necessity of assisting mentally retarded persons to develop their abilities in various fields of activities and of promoting their integration as far as possible in normal life. The UN and other bodies are aware that certain countries, at their present stage of development, can devote only limited efforts to this end. Proclaims this Declaration on the Rights of Mentally Retarded Persons (UN 1971) and calls for national and international action to ensure that it will be used as a common basis and frame of reference for the protection of these rights:

1. The mentally retarded person has, to the maximum degree of feasibility, the same rights as other human beings.
2. The mentally retarded person has a right to proper medical care and physical therapy and to such education, training, rehabilitation and guidance as will enable him to develop his ability to maximum potential.
3. The mentally retarded person has a right to economic security and to a decent standard of living. He has a right to perform productive work or to engage in any other meaningful occupation to the fullest possible extent of his capabilities.
4. Whenever possible, the mentally retarded person should live with his own family or with foster parents and participate in different forms of community life. The family with which he lives should receive assistance. If care, in an institution, becomes necessary, it should be provided in surroundings and other circumstances as close as possible to those of normal life.
5. The mentally retarded person has a right to a qualified guardian when this is required to protect his personal well-being and interests.
6. The mentally retarded person has a right to protection from exploitation, abuse and degrading treatment. If prosecuted for any offence, he shall have a right to due process of law with full recognition being given to his degree of mental responsibility.
7. Whenever mentally retarded persons are unable, because of the severity of their handicap, to exercise all their rights in a meaningful way or it should become necessary to restrict or deny some or all of these rights, the procedure used for that restriction or denial of rights must contain proper legal safeguards against every form of abuse. This procedure must be based on an evaluation of the social capability of the mentally retarded person by qualified experts and must be subject to periodic review and to the right of appeal to higher authorities.

DRUG DE-ADDICTION PROGRAM ALCOHOLISM

Alcoholism is defined as a chronic and progressive

disease characterized by loss of control over the use of alcohol with subsequent social, legal, psychological and physical consequences .The word "Alcohol" has been derived from the Arabic word "Alkuhi" meaning essence. Over the last 30-40 years alcohol consumption has increased in quantity and frequency. Today, alcohol abuse has become a worldwide social and medical problem. With rapid socioeconomic and cultural changes the alcohol is viewed as a symbol of social status and prestige as projected by their role models. The age at which people start alcohol has also declined. Government has also decreased the age drinking of from 28 years in 1990 to 19 years in 2008 in India. The classification of alcohol use according to DSM IV is given in table 21.3.

Globally there are 2 billion alcohol consumers with 2.3 million cases of alcoholism and 1.8 million deaths every year. The different drug abuse surveys have shown the prevalence of alcoholism as 5 to 20 percent. Rate of alcohol dependence in India is relatively less as compared to rates in China and average world. The world average is 2058 (male) and 276 (female) per 100,000 population. For China it is 885 (male) and 71 (female) per 100,000 population and for India it is 656 (male) and 56 (female) per 100,000 population (Global Health Statistics 2006). Number of people consuming alcohol has increased from one in 300 to one in 20. There are more than 2 lakh new cases of alcohol abuse each year. Over 65% of the alcohol produced in South East Asia is from India. Indian also contributes to 7% of the total alcohol beverages imports into the region. India has 125 de-addiction centers out of which more than 40 are in the Northeastern States.

Alcoholism is a major health problem in India in both rural and urban areas (Murthy 1992). Majority of the antisocial activities such as robbery, thefts, lying, murders, fights, rape etc. are all linked with alcoholism in some or the other way. There is a profound social impact on the lives of women and families of affected people. This impact was vividly demonstrated in a recent study reported a link between the high rate of depression in women attending primary care clinics and the presence of a problem drinker in their homes (Patel et al 1998).

Table 21.3: Terms and criteria for patterns of alcohol use -According to DSM IV criteria

No.	Term	Criterion
1	**Moderate drinking**	• Men<2drinks /day • Women <1drink/day • Over 65 years<1 drink/day
2	**At risk drinking**	• Men >14 drinks/day or >4 drinks on an occasion • Women >7 drinks/day Or > 3drinks on an occasion
3	**Alcohol abuse**	• Maladaptive pattern of alcohol use leading to clinically significant impairment or distress. It is manifested with in 12 months period by three or more of the following- Failure to fulfill roles or obligations at work. • Recurrent use in hazardous situation. • Legal problems due to alcohol. • Continued use despite alcohol related social and interpersonal problems.
4	**Alcohol dependence**	• Maladaptive pattern of alcohol use leading to clinically impairment or distress manifested with in a 12 month period by 3 or more of the following- - Tolerance - Withdrawal symptoms - Use of larger quantities over a period of time than intended. - Persistent desire or unsuccessful attempt to cut down or control use. - Great deal of time spent obtaining or using or recovering from use. - Important social, occupational or recreational activities given up or reduced. - Use despite knowledge of alcohol related physical or psychological problems.
5	**Hazardous drinking**	• Person at risk for adverse consequences.
6	**Harmful use**	• Use resulting in physical or psychological harm.

Health effects: Alcohol consumption has many effects on physical and mental health. Recent amnesia, guilt feelings, social violence and quitting of jobs leading to increased isolation are found in initial phase. Effect on brain - sleep impairment, peripheral neuropathy, cerebellar degeneration-unsteadiness, nystagmus, and multivitamin deficiency. Depression, anxiety, blackouts, memory impairment and psychosis especially during abstinence are also developed. Gastrointestinal tract effects-gastritis, severe inflammation of esophagus, acute pancreatitis leading to insufficiency of sugar metabolism, fatty liver, hepatitis, liver failure and the end result may be hepatic encephalopathy. Alcohol plays a role in nearly 30% of cases of cancer, liver, chest and throat diseases and is blamed for up to a third of all traffic injuries.

Cardiovascular diseases associated with alcohol are hypertension, elevation of triglycerides leading to increased risk of atherosclerosis and myocardial infarction. With heavy intoxication alcohol may act as a toxin and destroy cardiac muscles (alcoholic cardiomyopathy). Prolonged use of 4-8 drinks per day decreases the number of WBC and impairs their migration to site of infection; this also impairs the production of RBC and platelets. Alcohol intake also increases the risk of carcinoma of tongue, esophagus, stomach, liver, colon and lungs. Pregnant females are advised to abstain from alcohol as it can cross placenta and can have deleterious effect on fetus in the form of abnormalities, death or an early abortion. The survivors suffer from severe mental retardation, small size of head, low birth weight, facial deformities, cardiovascular anomalies like ASD, cognitive and behavioral problems.

Treatment: After establishing diagnosis, engage the patient in the process of behavioral change. Motivate a patient, advise and provide brief interventions for at risk and problem drinkers. And for those who have begun to change their behavior a regular monitoring of action is required for maintenance of their remission. The FRAMES acronym summarizes a counseling strategy commonly used in brief interventions:

- Feed back.
- Review problems experienced because of drinking, Responsibility: changing alcohol use is the patients responsibility.
- Advice: advice to cut down or abstain.
- Menu: provide options for changing behavior.
- Empathy: use an empathic approach.
- Self efficacy: encourage optimism about changing behavior.

Treatment of alcohol dependence consists of two phases-Detoxification and Rehabilitation. Detoxification ameliorates the symptoms and signs of withdrawal; rehabilitation helps the patient to avoid future problems with alcohol.

Self Help Groups-This comprises of meetings, discussions and different approaches to overcome alcoholism by an individual. The benefits of such groups are that they provide peer support and opportunities for alcohol free social interactions. This may involve cognitive behavioral coping skills to reduce the likelihood of relapse. These measures are adopted in many de-addiction centers run by Government and private bodies.

Policy and Legislation Measures in India

Alcohol policy is under the legislative power of individual states. Prohibition, enshrined as an aspiration in the Constitution, was introduced and then withdrawn in Haryana and Andhra Pradesh in the mid-1990s, although it continues in Gujarat, with partial restrictions in other states. - Delhi, for example, has dry days. There was an earlier failure of prohibition in Tamil Nadu. Increasing taxes and prohibitions are failed in many places leading to an increase in corruption, crime, and the production and consumption of illegal liquor, which is more dangerous.

An important aspect of policy is to delay initiation among youth. One way of doing this is to enforce age limits. The legal minimum age to purchase liquor ranges from 18 years in some state to 25 years in others. Delhi has minimum age limit of 25 years. It has, however, been shown that an increase in the legal age of drinking from 18 years to 21 years achieves nearly 60 per cent of the effect of prohibition on alcohol consumption. The Cable Television Network (Regulation) Amendment Bill, in force from September 8, 2000, completely prohibits cigarette and alcohol advertisements. The government controlled channel, Doordarshan, does not broadcast such advertisements but satellite channels however are replete with them.

There are many laws in India but has no effect because enforcement is the weakest aspect of the Indian system. There is a lack of genuine political will. Failure of the enforcement agencies limits the value of legislative strategies in India.

Efforts to counteract the problem: The Ministry of Social Justice and Empowerment has been active in this field. In 1985-86 it urged the establishment of a reduction measures. The ministry cooperates with media and youth organizations and collaborates with the Ministry of Health and Family Welfare and with NGOs involved in the problem. The Ministry of Social Justice and Empowerment in partnership with the United Nations International Drug Control Program (UNDCP) and the International Labor Organization (ILO), has launched major initiatives for alcohol and drug demand reduction.

Community initiative is required for drug control. The TTK Foundation an NGO in South India has established a comprehensive range of health and social programs to counter alcoholism (Chakradhar 1993). Religious groups are especially important in some areas; for example, the churches and monasteries provide counseling services for various vulnerable groups. Local police should be encouraged to develop community policing programs to enforce existing laws relating to alcohol. Local self-government officials such as *panchayat* leaders could pave the way for new political initiatives.

Health & Social Interventions

The greater involvement and awareness amongst medical practitioners alcoholism is required. Very often, a drunk with hematemesis is saved by surgerajaint and blood transfusions and then discharged with no advice on where to seek treatment for his drinking problem. The response of the medical community to alcoholism is either outdated (focusing on detoxification in psychiatric units) or ignorant (pretending this is not a health problem at all). Training on the recognition and management of alcoholism for medical schools and continuing medical education for practicing physicians, particularly general practitioners is required.

Health Education: Health education is the tool of primary prevention. Education should start from schools and should focus on the dangers of alcohol and the merits of abstinence or sensible drinking in high schools and colleges.

Substance Dependence

Since time immemorial, in most countries of the South-East Asia Region, drugs (usually cannabis and opium products) have traditionally been used, for ritual, religious, and recreational purposes. The apparent social acceptance of the use of such substances stemmed largely from the fact that there was no abuse. Unfortunately what we are witnessing today is a virtual epidemic of drug abuse. A disturbing trend is that more and more younger people are being drawn into this devastating habit. The South East Asia Region is particularly affected by the problem of substance dependence. The "Golden Triangle" (Myanmar, Laos, Thailand), part of the region is infamous for the same. India has become a major transshipment point for hard drugs from Pakistan to the West. Indonesia has begun to recognize the increasing problem of substance dependence.

Alcohol, cannabis and raw opium have been the traditional drugs of abuse in India. There is a substantial volume of published reports on the prevalence of drug use in India. Data published by the Government of India, Ministry of Welfare for 92-93 shows that there were 2,70,173 cases of drug abuse reporting to welfare and rehabilitation centers supported by the Ministry of Social Justice & Empowerment. The breakup of these patients by type of drug abused is given in table 21.4.

Table 21.4: Drug abuse pattern in India

Type of substance	Percentage
Alcohol	52.8
Opium	16.7
Heroin	5.0
Smack	12.9
Others	12.6

There are approximately 3 million (about 0.3 per cent of total population) victims of different kinds of drug usages, excluding alcohol dependents in India. Such population comes from diverse socio-economic, cultural, religious and linguistic backgrounds. India is the biggest supplier of illicit demand for opium required primarily for medicinal purposes. Besides this, India is located close to the major poppy growing areas of the

world, with "Golden Crescent" on the Northwest and "Golden Triangle" on the North–East. These make India vulnerable to drug abuse particularly in poppy growing areas and along the transit/trafficking routes.

Most of the heroin dependence in Manipur is observed along the highways. Opium poppy grown on 8700 hectares by over 85,000 farmers holding licences in UP, MP, and Rajasthan. 15-25% opium diverted to illicit market. The total 400 tones of opium is produced in India. In North-East regions of the country, around 1% of the population is suffering from injecting drug abuse. In one of the surveys conducted by the Institute of Narcotics studies and analysis, on 2 districts of Arunachal Pradesh, it was found that 90% of the villagers in Anjaw district and 63% of Lalit cultivate opium (16441 Hecter Land) because it is profitable and it was found that 36% and 15.1% of buyers were government employees and belonged armed forces to respectiely. 47.7%-39.9% villagers are ready to give up opium cultivation, if any viable crop and support is provided (Mail Today 2011; 28th May: Arunachal villagers in the grip of opium).

CANNABIS

This plant grows wild throughout the tropic and temperate regions. Three drugs come from cannabis-marijuana, hashish and hashish oil. Its street names are: Blubbers, Boom, Gangster, Ganja, Grass, Hashish/ Chara, Herb, Pot, Reffer, Weed. Cannabis is abused for its euphoric effects. The short-term effects of cannabis include problems with memory and learning, distorted perception, difficulty in thinking and problem-solving and loss of coordination. The effect of marijuana on perception and coordination are responsible for serious impairments in driving abilities. Long term chronic use is associated with "Amotivational Syndrome", characterized by apathy, impairment of judgment, memory and concentration, and loss of motivation, ambition and interest in the pursuit of personal goals. High doses can result in mental confusion, panic reactions and hallucinations.

HEROIN

Heroin is a highly addictive drug and the most rapidly acting of the opiates. The street names are Big H, Black Tar, Chiva, Hell Dust, Horse, Negra, Smack and Thunder. Heroin is typically sold as a white or brownish powder, or as the black sticky substance known on the streets as "black tar heroin". Although pure heroin is becoming more common, most street heroin is "cut" with other drugs or with substances such as sugar, starch, powdered milk, or quinine. Because it enters the brain so rapidly, heroin is particularly addictive, both psychologically and physically. Heroin abusers report feeling a surge of euphoria or "rush", followed by a twilight state of sleep and wakefulness.

COCAINE

Cocaine is an intense, euphoria producing stimulant drug with strong addictive potential. The street names are: Coca, Coke, Crack, Flake, Snow, Soda Cot. Cocaine is usually distributed as a white, crystalline powder. Cocaine is often diluted ("cut") with a variety of substances, the most common of which are sugars and local anesthetics. It is "cut" to stretch the amount of the product and increase profits for dealers. In contrast, cocaine base (crack) looks like small, irregularly shaped chunks (or "rocks") of a whitish solid, Physiological effects of cocaine include increased blood pressure and heart rate, dilated pupils, insomnia and loss of appetite. The widespread abuse of highly pure street cocaine has led to many severe adverse health consequences such as: cardiac arrhythmias, ischemic heart conditions, sudden cardiac arrest convulsions, strokes and death. In some users, the long-term use of inhaled cocaine has led to a unique respiratory syndrome and chronic snorting of cocaine has led to the erosion of the upper nasal cavity.

MARIJUANA

Marijuana is a mind-altering (psychoactive) drug, produced by the Cannabis sativa plant. Marijuana contains over 400 chemicals. THC (delta-9-tetrahydrocannabinol) is believed to be the main chemical ingredient that produces the psychoactive effect. Street names are: Aunt Mary, BC Bud, Blunts, Boom, Chronic, Dope, Gangster, Ganja, Grass, Hash, Herb, Hydro, Indo, Joint, Kif, Mary Jane, Mota, pot, Reefer, Sinsemilla, Skunk, Smoke, weed, Yerba. Marijuana is dry, shredded green/brown mix of flowers, stems, seeds and leaves from the Cannabis sativa plant. The mixture typically is green, brown or gray in colour and may resemble tobacco.

OPIUM

Opium is a highly addictive non-synthetic narcotic that is extracted from the poppy plant, Papaver

somniferum. The opium poppy is the key source for many narcotics, including morphine, codeine and heroin. Street names are: Ah-pen-yen, Aunti, Aunti Emma, Big O, Black Pill, Chandoo, Chandu, Chinese Molasses, Chinese tobacco, Dopium, Dover's Powder, Dream Stick, Dreams, Easing Powder, Fi-do-nie, Gee, God's Medicine, Gondola, Goric, Great Tobacco, Guma, Hop/hops, Joy Plant, Midnight Oil, Mira, O, O.P., Ope, Pen Yan, Pin Gon, Pox, Skee, toxy, Toys, Whenshee, Ze, Zero. Opium can be a liquid, solid or powder but most poppy concentrate is available commercially as a fine brownish powder. The intensity of opium's euphoric effects on the brain depends on the dose and route of administration. An opium "high" is very similar to a heroin "high".

Factors responsible for Substance Use

Over the years, drug addiction is becoming an area of concern as traditional moorings, effective social taboos, emphasis on self-restraint and pervasive control and discipline of the joint family and community are eroding. The processes of industrialization, urbanization and migration have led to loosening of the traditional methods of social control rendering an individual vulnerable to the stresses and strains of modern life. The fast changing social milieu, among other factors, is mainly contributing to the proliferation of drug abuse, both of traditional and of new psychoactive substances. The introduction of synthetic drugs and intravenous drug use leading to HIV/AIDS has added a new dimension to the problem, especially in the Northeast states of the country.

Constitutional and Legal Framework

Article 47 of the Constitution of India directs the State to regard the raising of the level of nutrition and the standard of living of its people and the improvement of public health as among its primary duties, and, in particular, to endeavor to bring about prohibition of consumption, except for medicinal purposes, of intoxicating drinks and drugs which are injurious to health.

Section 71 of the Narcotic Drugs and Psychotropic Substances Act, 1985 (as amended) provides as under: "Power of Government to establish centers for identification, treatment, etc., of addicts and for supply of narcotic drugs and psychotropic substances -

1. The Government may, in its discretion, establish as many centres as it thinks fit for identification, treatment, education, after-care, rehabilitation, social reintegration of addicts....."
2. The Government may make rules consistent with this Act providing for the establishment, appointment, maintenance, management and superintendence of ..... the centres referred to in sub-section (1) and for the appointment, training, powers, duties and persons employed in such centers."

Demand Reduction Strategy - A Welfare Approach

It has two-pronged strategy viz. supply reduction and demand reduction. Whereas the supply reduction is under the purview of the enforcement agencies with the Department of Revenue as the nodal agency, the demand reduction strategy is under the domain of social sector and the Ministry of Social Justice & Empowerment in Government of India is responsible for implementation of demand reduction strategy in the country.

Over the years it was realized that the drug abuse is not only a problem arising out of the availability of such intoxicating drinks and drugs but it has a great deal to do with the social conditions which create the demand for or the need for consumption of such substances. The vulnerability of the modern society plays a catalytic role in promoting the consumption and abuse of narcotic and psychotropic drugs. With this the need arose for implementing strategies for prevention of drug abuse, educating the people about its ill effects and rehabilitation of the addicts.

Govt. of India has following strategy for demand reduction:

1. Building awareness and educating people about ill effects of drug abuse
2. Dealing with the addicts through program of motivational counseling, treatment, follow-up and social-reintegration of recovered addicts.
3. To impart drug abuse prevention/rehabilitation training to volunteers with a view to build up an educated cadre of service providers.

Treatment and Rehabilitation of Addicts – Government - NGO Collaboration

The Ministry of Social Justice & Empowerment has been implementing the ***Scheme for Prohibition and Drug Abuse Prevention*** since the year 1985-86.

Under this Scheme, the Ministry is assisting 361 voluntary organizations for maintaining 376 De-addiction-cum-Rehabilitation Centers and 68 Counseling and Awareness Centers all over the country.

The rehabilitation and social reintegration of an addict is the mainstay of any such initiative. Therefore all programs for treatment of addicts must compulsorily integrate into delivery system, programs for psychosocial counseling of the addict and his family/ peer groups; programs for vocational training/ rehabilitation and comprehensive program for after-care and follow-up.

To attain these objectives, all centers are equipped with a cadre of experts from various fields including doctors, counselors, community workers, social workers etc. Thus, it is a multi-disciplinary approach.

Treatment-cum-Rehabilitation Centers

The Treatment-cum-Rehabilitation Centers will provide following services to the community: (i) Preventive Education and Awareness Generation; (ii) Identification of addicts; (iii) Motivational Counseling; (iv) Detoxification/Deaddiction; (v) Vocational Rehabilitation; (vi) After care and Reintegration into the social mainstream. While a period of one month may generally be required for a substance abuser to undergo various phases of counseling, deaddiction and psychological recovery, a provision for aftercare will be made for a maximum period of another one month in deserving cases. After detoxification, the recovering substance abusers will be encouraged to go out to their families and work places. These centers would also be encouraged to take up income generation activities to facilitate the economic rehabilitation of the addicts. The centers ordinarily have 15 bedded or 30 bedded facility.

Awareness and Preventive Education

The Counseling and Awareness Centers are engaged in a wide range of awareness generation program in varied community settings including village panchayats, schools etc. Besides these Centers, the Ministry has been actively utilizing the various media channels, print as well as audiovisuals for educating the people on the ill effects of drug abuse and also disseminating information on the service delivery.

Role of the ministry of health and family welfare in the area of drug de-addiction is demand reduction by way of providing treatment services including preventive health and after care. State government shall provide necessary land and also meet the recurring expenses towards staff, medical care, diet, maintenance, etc. National Drug Dependence Treatment Center has been established under AIIMS administration at Ghaziabad, UP. Linkages between the Ministry of Social Justice and Empowerment, and the Health have been established. Government has enacted many legislation for the control of drugs in the country.

Training and Manpower Development – Development of Service Providers

The Government has established a National Centre for Drug Abuse Prevention (NC-DAP) under the aegis of the National Institute of Social Defence, New Delhi, to serve as the apex body in the country in the field of training, research and documentation in the field of drug abuse prevention.

To meet the growing demand of rehabilitation professionals in the country, the Center has been conducting three months' Certificate Course on Deaddiction Counseling and Rehabilitation of Drug Abusers. The Center has been conducting advocacy programs, seminars, conferences and training courses all over the country in collaboration with the State Govt. Institutions and NGOs for sensitization, awareness generation and training.

Inter-Sectoral Collaboration

The problem of alcoholism and drug abuse is a social malaise and is dealt holistically by targeting all spheres of human activity. The Government of India has been following an integrated approach involving all concerned Ministries and Departments who could complement and supplement the initiatives being taken by each other. The initiatives being taken include imparting education on drugs and positive alternative to the youth through appropriate modification in school curriculum and sensitizations of school environment. Programs are being developed for the sensitization of the teachers, parents and the peer groups in a school environment through the participation of the Non-Government Organizations. The cooperation of the media, youth organizations and sectors such as industry, tourism, and health sector

International Cooperation - An Enrichment Process

The Ministry of Social Justice & Empowerment, in collaboration with the International Labor Organization and UNODC, implemented a project on "Developing Community Drug Rehabilitation and Workplace Prevention Programs", to sensitize and train the voluntary organizations and workplace settings on prevention of alcoholism and substance abuse in workplace.

Areas which need to be Highlighted in Future – Possibilities of Future Collaboration

1. Information linkage
2. Better & personalized data management
3. Research on usage of indigenous methods of treatment both in medicinal & therapeutic
4. Accelerated awareness campaign
5. Department of Revenue has failed in its responsibility to reduce supply of drugs particularly alcohol. In some states the age of drinking has been reduced and increased the hours of restaurants.

To provide treatment services, including preventive and after care and de-addiction of an addict, the Ministry of Health & Family Welfare started Drug-De-addiction Program in 1987-88. The first 30 bedded center was established at All India Institute of Medical Sciences, New Delhi, thereafter each such in Jawaharlal Institute of Post Graduate Medical Education and Research (JIPMER) Puducherry, In New Delhi Lady Hargdinge Medical College (LHMC), Ram Manohar Lohia (RML) Hospital, Post Graduate Institute of Medical Education and Research (PGIMER) Chandigarh, and National Institute of Mental Health & Neuro Sciences (NIMHANS), Bangalore were also established. With the assistance of UNDP more centers were started in Mumbai and Calcutta. These centers provide not only de-addiction services but also training to medical / paramedical professional, preparing health education material and render community outreach services.

There are 111 centers in different states/UTs, of which 33 are located in North Eastern States. The central assistance to these states has been provided in the form of construction grant, equipments, training of trainers mainly doctors / paramedics, etc. To the North-Eastern states recurring grant for medicines, linen, diet, etc., are also provided. Rapid assessment surveys have been started to assess drug-addiction situation in the country.

From 1998 onwards the attention has been focused on promotion of community based approach with community empowerment. Other steps are developing linkages with vertical programs like HIV/AIDS and Tuberculosis, inter and intra-sectoral coordination and appointment of nodal officer for both HIV/AIDS and Drug De-addiction Program. A National Drug De-Addiction Center under All India Institute of Medical Sciences, New Delhi is being established in Ghaziabad, UP.

Scheme for Prevention of Alcoholism and Substance (Drug) Abuse

The Ministry of Social Justice and Empowerment, under its demand reduction strategy, provides preventive awareness, motivational counseling, curative treatment and post treatment rehabilitation to victims of drugs and alcohol addiction through the voluntary organizations and government bodies. There are 401 treatment cum rehabilitation centers and 41 counseling and awareness centers working all over the country. 24 new De-addiction centers have been sanctioned to increase the coverage of the scheme. 177 treatment cum rehabilitation centers empowered to provide counseling for prevention of HIV/AIDS. Overall supervision is being carried out by National Institute of Social Defence, New Delhi under the Ministry of Social Justice and Empowerment. They are entrusted with the responsibility of awareness generation, motivational counseling, treatment, rehabilitation and social integration of drug dependents.

Drug Help Lines: There is toll free telephone number 1800-11-3872 for information on - early prevention options, available treatment and counseling services. Linkages with rehabilitation services and self-help groups.

National Network of recovering addictions was set upon the internet in June 2005: Online abuse monitoring system has been started in October 2004 for monitoring trends and patterns among addicts receiving treatment.

COMMENTS

Various programs run by different ministries are good efforts but in isolation they do not have any impact on

the problem. Social welfare and health department usually work independently and appropriate management package is never made available to the patients. Drug addiction is remains a major concern and legislations available for controlling the problems are usually not implemented adequately.

World Mental Health Day

World Mental Health Day (10 October) is a day for global mental health education, awareness and advocacy. It was first celebrated in 1992 at the initiative of the World Federation for Mental Health, a global mental health organization with members and contacts in more than 150 countries. This day, each October, thousands of supporters come to celebrate this annual awareness program to bring attention to Mental Illness and its major effects on peoples' life worldwide. In some countries this day is part of an awareness week, such as Mental Illness Awareness Week in the US and Mental Health Week in Australia and India.

World Suicide Prevention Day

The World Health Organization estimates that over 800,000 people die by suicide each year – that's one person every 40 seconds. Up to 25 times as many again make a suicide attempt. The tragic ripple effect means that there are many, many more people who have been bereaved by suicide or have been close to someone who has tried to take his or her own life. And this is happening in spite of the fact that suicide is preventable. 'Connect, communicate, care' is the theme of the 2016 World Suicide Prevention Day. These three words are at the heart of suicide prevention.

The first World Suicide Prevention Day was held in 2003 and was an initiative of the International Association for Suicide Prevention and the World Health Organization (WHO). Since then, World Suicide Prevention Day has taken place on 10th September each year.

References

Anita, Gaur DR, Vohra AK, et al. Prevalence of Psychiatric morbidity among 6 and 14 years old children. Ind J Com Med 2003; 28: 133-137.

Barua A, Jacob GP, Mahmood SS at al. A study on screening for psychiatric disorders in adult population. Ind J Com Med 2007; 32(1): 56-66.

Brundtland GH. Mental Health in the 21st Century (Editorial): Bull WHO 2000; 78:411.

Chakradhar, K. (1993) TTK Hospital: A Pioneer in the field of alcoholism treatment in India. In Mental Health in India: Issues & Concerns (eds P Mane & K Gandevia). Tata Institute of Social Sciences, Mumbai (pp277-291).

Chan S, Torous J, Hinton L, Yellowlees P. Towards a framework for evaluating mobile mental health apps. *Telemed J E Health* 2015; *21* : July 14.

Dube KC. A study of prevalence and biological variables in mental illness in a rural and urban community in UP, India. Acta Psychiat Scand. 1970, 46: 327

Ganguli HC. Epidemiological findings on prevalence of mental disorders in India. Ind J Psychiatry 2000; 42 (4):14-20.

Govt. of India. Annual Report 2005-2006 and 2009-10. Ministry of Health & Family Welfare, Nirman Bhawan, New Delhi.

Grover, S., Avasthi, A., Chakrabarti, S., Bansali, A. and Kulhara, P. Cost of care of schizophrenia: a study of Indian outpatient attenders. Acta Psychiatrica Scandinavica 2005; 112:54-63.

Haq MZU et al. National Mental Health Programme in India: un update. Indian Journal of Social Psychiatry 2008; 24 (1): 22-29.

Kapur RL. An illustrative presentation of a population survey on mental disorders: cross-cultural study of mental disorders in Indian setting, WHO seminar on the organization of mental health services, Addis Abada, Nov-Dec 1973, EM/SEM. Org. SERV/13.

Kishore J, Reddaiah VP, Kapoor V, Gill JS. Characteristics of Mental Morbidity in a rural primary health center of Haryana. Ind J Psychiatry 1996; 38 (3): 137-142.

Kishore J, Vinay Kapoor. Mental Health through subcenter: An approach. Swasth Hind 1996 Jan-March : 9-11.

Kishore J. A Dictionary of Public Health. 3rd edition: New Delhi Century Publications 2013.

Kukreti P, Kishore J, Kumar P. Economic burden of health care in severe mental illnesses: Indian Perspective. International Journal of Current Research 2016; 8 (4): 29560-29565.

Malik SC. Mental Health Program & Legislation in India: Some Observations and Experiences. India J Psychiatry 2004; 46(1): 15-24.

Mukherjee R, J Kishore, RC Jiloha. Attitude towards psychiatry and psychiatric illness among medical professionals. Delhi Psychiatry Bulletin 2006; 9 (1): 34-38.

Murali MS. Epidemiological study of prevalence of mental disorders in India. IJCM 2001; 26(4): 198-200.

Murray CJL, Lopez AD. The Global Burden of Disease: A comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2020. Combridge Mass: Harvard University Press 1996.

Murthy, R.S. (1992). Mental Health. In State of India's Health. (Ed A Mukhopadhyay), Voluntary Health Associations of India. New Delhi (pp 405).

NCMH. National Commission on Macroeconomic and Health. Govt. of India, New Delhi. 2005

National Crime Records Bureau. Accidental Deaths and Suicides in India. Ministry of Home Affairs, Govt of India 2010.

National Mental Health Program Document 1982, Directorate General of Health Services, Govt. of India, New Delhi.

Patel V, Pereia J, Coutinho L, et al. Is the labeling of Common

mental disorders as psychiatric illness useful in primary care? Indian J Psychiatry 1997; 39: 239-246.

Patel V, Pereira J, Fernandes J, Mann A. Poverty, psychological disorder and disability in primary care attenders in Goa, India. British Journal of Psychiatry, 1998; 172, 533-536.

Reddy MV, Chandrashekhar CR. Prevalence of Mental and behavioral disorders in India: A meta-analysis. IJP 1998; 40: 149-157.

Rupani et al. Cross-sectional study on socio-demographic and clinical correlates of depression among human immunodeficiency virus-positive patients in Surat City, Western India. *Asia-Pacific Psychiatry* 7 (2015) 406–418.

Sagar R, Kishore J. Rural Health Services in India. *Yojana* Monthly of Planning Commission Govt. of India, May 2007: 22-26

Saha S, Chant D, et al. A systematic review of prevalence of schizophrenia. PLoS Med 2005; 2 (5): e141.

Srivastava A. et al. National Household Survey of Drug Abuse in India 2002. Report submitted to Ministry of Social Justice and Empowerment, Government of India and UN office of Drugs and Crime, regional Office for South Asia.

Sarkar K. et al. Relationship of National highway with injecting drug abuse and HIV in rural Manipur India. Indian Journal of Public Health, 1997, XXXXI (2) 49-51.

Sarma, P., Das, S.K. and Deshpande, S. 2006. An estimate of the monthly cost of two major mental disorders in an Indian metropoilis. Ind J psychiatry 2006; 48(3):143-8.

Sethi BB, Gupta SC, Raj Kumar, Kumari P. A psychiatric survey of 500 rural families. Ind J Psychit 1972; 14: 183.

UN. Principles for the Protection of Persons with Mental Illness, General Assembly resolution 46/119 of 17 December 1991.

US. Declaration on the Rights of Mentally Retarded Persons. G.A. res. 2856 (XXVI), 26 U.N. GAOR Supp. (No. 29) at 93, U.N. Doc. A/8429 (1971) The General Assembly.

WHO. WHO Atlas 2001: Country Profile on mental health Resources 2001. WHO Department of Mental Health and Substance Dependence. Geneva WHO.

WHO. the World Health report. Reducing risks, promoting health life. World Health Organization. Geneva 2002.

Yellowlees P& Chan S. Mobile mental health care - an opportunity for India. Indian J Med Res 142, October 2015, pp 359-361.

CHAPTER 22

NATIONAL PROGRAMS FOR PREVENTION AND CONTROL OF CANCER, DIABETES, CARDIOVASCULAR DISEASES AND STROKE

Lifestyle Disorders

Lifestyle was originally coined by Austrian psychologist Alfred Adler in 1929 which means the way a person lives. A lifestyle is a characteristic bundle of behaviors that makes sense to both others and oneself in a given time and place, including social relations, consumption, entertainment, and dress. The behaviors and practices within lifestyles are a mixture of habits, conventional ways of doing things, and reasoned actions. A lifestyle typically also reflects an individual's attitudes, values or worldview. Surrounding social and technical systems can constrain the lifestyle choices available to the individual and the symbols she/he is able to project to others and the self. The individual lifestyle has become the cause of his/her illness. This is evident from the last century when individual become the consumer of products leading to sedentary lifestyle and eating fast and energy rich food. This is now causative factor for diabetes, metabolic syndrome, cardiovascular diseases, stroke, mental disorders, osteoporosis, liver diseases, cancers, etc. Understanding the serious impact of modern lifestyle on health and environment, a new concept is emerging to conteract this consumerism. For example, "green lifestyle" means holding beliefs and engaging in activities that consume fewer resources and produce less harmful waste, and deriving a sense of self from holding these beliefs and engaging in these activities.

Assessment of burden of Non-Communicable Diseases

STEPS Wise Approach

STEP-wise approach is developed by WHO to NCD Surveillance consists of a hierarchy of information which can be collected using standardized instruments and protocols to ensure comparability over time and across locations. It is based on sequential levels of surveillance of different aspects of NCDs, allowing flexibility and integration at each step. STEP 1 consists of collection of information by interview alone. This includes questions on tobacco and alcohol use, dietary and physical activity patterns. STEP 2 adds measurement of blood pressure and anthropometry. STEP 3 requires blood collection for estimation of blood sugar and cholesterol levels. At each level, there are core, expanded and optional questions. While core questions are mandatory for all users, the expanded and optional questions can be used depending upon local requirements.

NCD risk factors targeted by STEPS approach have been chosen because they are measurable and modifiable. Also, available evidence indicates that reducing these risk factors is feasible and would have a major impact on the disease outcomes. Bangladesh, India, Indonesia, Maldives, Myanmar, Nepal, Sri Lanka and Thailand have already initiated STEPs surveys or are planning to conduct these surveys in 2003.

The WHO Stepwise surveillance of NCD risk factors carried out in 5 Indian states showed that only 50% of the population aged 15-64 years, consumed vegetable daily and 60-80% led a sedentary lifestyle.

Rural-urban differences reveal that risk factors like obesity, truncal obesity, hypertension, high cholesterol, low HDL cholesterol and diabetes are more in urban areas. Case-control studies also confirm the importance of these risk factors. The INTERHEART-South Asia study identified that eight established coronary risk factors—abnormal lipids, smoking, hypertension, diabetes, abdominal obesity, psychosocial factors, low fruit and vegetable consumption, and lack of physical activity—accounted for 89% of the cases of acute myocardial infarction in Indians (Joshi P et al 2007). There is epidemiological evidence that all these risk factors are increasing (Gupta R et al 2008). Over the past fifty years prevalence of obesity, hypertension, hypercholesterolemia, and diabetes have increased significantly in urban (R2 0.45-0.74) and slowly in rural areas (R2 0.19-0.29). Prevalence of hypertension has increased in both urban and rural subjects and presently is 25 – 40% in urban and 10 – 15% among rural adults (Gupta R et al 2004). Lipids levels are increasing and serial studies from a north Indian city reported increasing mean levels of total, LDL and non-HDL cholesterol and triglycerides HDL cholesterol. Diabetes it has more than quadrupled in the last 20 years from <1 – 3% to 10 – 15% in urban and 3 – 5% in rural areas [Gupta et al 2007]. Studies have reported increasing obesity as well as truncal obesity, due to sedentary lifestyles and psychosocial stress in the country [Gupta e tal 2008]. Risk factors such as obesity, sendentary lifestyle, stressfull working conditions, consumption of fried food, etc for heart diseases are increasing in urbon areas (Times of India Sept 28th, 2013)

There is an urgent need for development and implementation of suitable primordial, primary, and secondary prevention approaches for control of this epidemic. An urgent and sincere bureaucratic, political, and social will to initiate steps in this direction is required (Gupta R 2008).

OBESITY

Measures of Obesity

Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m^2). For example, an adult who weighs 60kg and whose height is 1.75m will have a BMI of 19.6.

BMI = 60 kg / (1.75 m^2) = 60 / 3.06 = 19.6

BMI values are age-independent and the same for both sexes. However, BMI may not correspond to the same degree of fatness in different populations due, in part, to different body proportions. The health risks associated with increasing BMI are continuous and the interpretation of BMI gradings in relation to risk may differ for different populations.

The WHO Expert accepted (WHO exert consultation 2004, James 2002) that the proportion of Asian people with a high risk of type 2 diabetes and cardiovascular disease is substantial at BMI's lower than the existing WHO cut-off point for overweight (= 25 kg/m^2). However, the cut-off point for observed risk varies from 22 kg/m^2 to 25 kg/m^2 in different Asian populations and for high risk, it varies from 26 kg/m^2 to 31 kg/m^2 . The Consultation, therefore, recommended that the current WHO BMI cut-off points (Table 22.1) should be retained as the international classification. But the cut-off points of

Table 22.1: The International Classification of adult underweight, overweight and obesity according to BMI

Classification	BMI(kg/m^2)	
	Principal cut-off points	**Additional cut-off points**
Underweight	**<18.50**	**<18.50**
Severe thinness	<16.00	<16.00
Moderate thinness	16.00 - 16.99	16.00 - 16.99
Mild thinness	17.00 - 18.49	17.00 - 18.49
Normal range	**18.50 - 24.99**	**18.50 - 22.99**
		23.00 - 24.99
Overweight	**≥25.00**	**≥25.00**
Pre-obese	25.00 - 29.99	25.00 - 27.49
		27.50 - 29.99
Obese	**≥30.00**	**≥30.00**
Obese class I	30.00 - 34.99	30.00 - 32.49
		32.50 - 34.99
Obese class II	35.00 - 39.99	35.00 - 37.49
		37.50 - 39.99
Obese class III	≥40.00	≥40.00

Source: Adapted from WHO 2004.

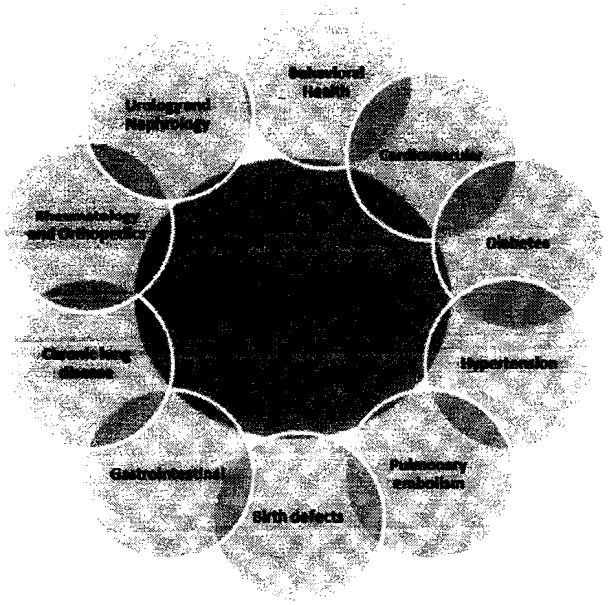


Figure 22.1: Health impact of Obesity

23, 27.5, 32.5 and 37.5 kg/m^2 are to be added as points for public health action. It was, therefore, recommended that countries should use all categories (i.e. 18.5, 23, 25, 27.5, 30, 32.5 kg/m^2, and in many populations, 35, 37.5, and 40 kg/m^2) for reporting purposes, with a view to facilitating international comparisons.

The statistics on illness arising from overweight and obesity are startling, for example:

- Deaths due to chronic heart diseases in India will increase to 2.03 million annually by 2010 and 2.58 million by 2020 (it was 1.59 million in 2000).
- The already high number of people with diabetes – 41 million – is expected to rise by 170 per cent in the next 20 years.
- One in every three urban Indians has high blood pressure, which is expected to increase by 60 per cent in the next 20 years.

Individual countries are all free to interpret waist recommendations differently. Diabetes UK, for example, has suggested levels of 94cm/37" for men of white or black ethnic background and 90cm/35" for Asian men, and for women of all ethnicities of 80cm/31.5". Health impact of diabetes is given in Figure 22.1.

CANCER

- From the period 3000 B.C. to 800 B.C., the ancient Egyptians mixed medicine and religion and treated patients for several forms of cancer.
- Galen had excised tumors, infected bones, resected ribs, and sternums.
- Ambroise Par'e became the greatest surgeon and surgical writer of the Renaissance. Pare recommended surgery for cancer only if cancer could be totally removed.
- The foundations of modern science were laid in 17th century when abnormalities of lymph were considered as primary cause of cancer as lymph node enlargement were frequently found associated with cancer.
- Oncology entered the age of reason in the years 1733-1788. Nuns, chimney sweeps and snuff takers established the connection between certain environments and onset of cancer.
- First cancer statistics was collected in mid 19th century.
- The era of 1895 to 1929 saw irradiation being used as treatment. Cancer research accelerated as Rontgen described X-rays, Curies isolated radium, and Muller observed abnormalities of cancer cells.
- Genetic explanation of cancer was put forward in early 20th century by professor of Zoology Theodor Boveri of Germany.
- A viral cause of cancer in 1911 was also put forward and physical & chemical carcinogens were conclusively identified.
- Chromosomal abnormalities were also identified as possible cause of cancer. Prolonged exposure to sun causing skin cancer was also observed.
- National Cancer Institute Act was passed in 1937. This act authorized annual funding on cancer research.
- Techniques to detect cancer in earlier stages also came into picture during this period. Active research on Molecular Biology was seen in the period between 1952 & 1971.
- Unlocking of Genetic code was a revolution sounded in 1953 by James Watson & Francis Crick who unveiled their model of DNA structure.
- In post 1971 era the newer approaches to control developed like training of immune system against cancer, radiolabel antibodies, blocking pathways of cancer, methods to foil metastasis by using drugs blocking various enzymes are still under progress. Other therapies like photodynamic therapy with laser technique, harnessing immune system are under active research.
- Cancer chemotherapy made large strides in seventies and various drugs like Cisplatin,

Adriamycin, Cyclophosphamide, Procarbazine, Mitomycin, and Bleomycin came in common use for cancer therapy. Rather chemotherapy became an integral part of anticancer therapy along with Radiotherapy and surgery for fight against cancer.

- Preventive aspects have again gained prime position in recent past i.e. 1993 to 1997 e.g. educating people on life style factors like nutrition and cancer, regular exercises etc. Screening the susceptible groups with respect to the age, nature of job, family history of cancer, controlling environment, etc.
- By 1996, P53 tumour suppressor genes and the protein encodes emerged as the most charmed topics of biochemical world. This has been planned to be used as a tool for early diagnosis also.

CANCER EPIDEMIOLOGY

Cancer refers to a class of diseases in which a cell or a group of cells divide and replicate uncontrollably, intrude into adjacent cells and tissues (invasion) and ultimately spread to other parts of the body than the location at which they arose (metastasis) (National Cancer Institute 2009).

Burden of Cancer

- According to International Agency for research on Cancer (IARC) , there were 10.9 million new cases, 6.7 million deaths, and 24.6 million persons living with cancer in the year 2002.
- Lung cancer is the most common cancer worldwide followed by breast. Highest rate recorded in male population of Detroit Michigan USA (518/lakh) and female population of Geneva, Switzerland (367/lakh). In developing countries, the commonest is lung (11.5% of the total), stomach (10.6%), breast (8.8%) and liver (8.8%).
- Cancer has become one of the ten leading causes of death in India. It is estimated that there are nearly 2 - 2.5 million cancer cases at any given point of time. Over 8-9 lakh new cases and 4 lakh deaths occur annually due to cancer.
- Data from population-based registries under National Cancer Registry Program indicate that the leading sites of cancer are oral cavity, lungs, oesophagus and stomach amongst men and cervix, breast and oral cavity amongst women. Oral and esophageal cancers are amongst the highest in the world and cancers of colorectal and prostrate are lowest.
- Cancers of oral cavity and lungs in males and cervix and breast in females account for over 50% of all cancer deaths in India.
- WHO has estimated that 91 per cent of oral cancers in South-East Asia are directly attributable to the use of tobacco and this is the leading cause of oral cavity and lung cancer in India.

Report of National Cancer Registries and Atlas of Cancer in India

- There are 97.8 (Bangalore) to 121.9 (Delhi) cancer cases per 1,00,000 population in urban males (age adjusted incidence rate).
- There are 92.2 (Bhopal) to 135.3 (Delhi) cancer cases per 1,00,000 population in urban females (age adjusted incidence rate).
- There are 46.2 (Barshi) cancer cases per 1,00,000 population in rural males (age adjusted incidence rate).
- There are 57.7 (Barshi) cancer cases per 1,00,000 population in rural females (age adjusted incidence rate).
- One in about 15 men and one in about 12 women in the urban areas could develop cancer in their lifetime.
- Breast cancer and cervical cancers are commonest among females.
- Cancer lung is commonest out of all tobacco related cancers in men.
- Age adjusted incidence rate of esophageal cancer in women of Bangalore is one of the highest (8.3 per 1,00,000) in the world.
- Cancer of tongue in males in Bhopal (8.8 per 1,00,000) is the highest in the world.
- Cancer of stomach is one of the main cancer in males in southern registries.
- Gall bladder cancer in Delhi women is one of the highest (8.9 per 1,00,000) in the world.
- 75-80% patients are in advance stage of the disease at the time of first attendance.

Future Projection: The world population is projected to increase by the rate of 80 million each year, and the population will be 8.9 billion in the year 2050. Further, due to increase in life expectancy, the proportion of elderly in developing countries is going to rise to 15% in the year 2050 from 5% in 2000 (UN 2002). The present load of cancer cases is going to increase almost 1/3rd in each of the next few decades. By 2050,

there will be 17 million new cases in the developing world (Ferlay et al 2004).

The projections were carried out for the various leading sites as well as for 'all sites' of cancer. In India, in 2011, nearly 1,193,000 new cancer cases were estimated; a higher load among females (603,500) than males (589,800) was noted. It is estimated that the total number of new cases in males will increased from 0.589 million in 2011 to 0.934 million by the year 2026. In females the new cases of cancer increased from 0.603 to 0.935 million. Three top most occurring cancers namely those of tobacco related cancers in both sexes, breast and cervical cancers in women account for over 50 to 60 percent of all cancers. When adjustments for increasing tobacco habits and increasing trends in many cancers are made, the estimates may further increase. The leading sites of cancers in males are lung, oesophagus, larynx, mouth, tongue and in females breast and cervix uteri. The main factors contributing to high burden of cancer over the years are increase in the population size as well as increase in proportion of elderly population, urbanization, and globalization (Neevan DR Dsouza et al. 2013).

Risk factors for cancers

Important risk factors for cancers is given in table 22.2.

Table 22.2: Risk factors for cancer

Factors/ class	% of cancer deaths in 35-64 yrs caused by factors
Tobacco	30-40
Alcohol	3-10
Diet	Not known
Reproductive & Sexual behavior	10
Occupation	6-8
Pollution	2
Industrial products	1
Medicines etc.	1
Geophysical factors	3

(Source: Nair et al NCMH 2005)

Genetic factors

There are three major types of genes, *oncogenes, tumour suppressor genes* and *genes that preserve the integrity of the genome*. It must be kept in mind that cancer is a multistep process and several genetic alterations are required for a full blown cancer phenotype. But knowledge of these help in prevention.

Interaction of genes and environment

Mutations in some p53 codons are more prevalent in cancer of a particular organ (e.g. oesophagus vs brain), the fingerprint of a particular carcinogen has been hard to define. The only exception has been liver cancer in regions with a high exposure to aflatoxin are shown to have a mutation in codon 249. However this is not always true. This observation could be a manifestation of different levels of aflatoxin exposure or of other modifying factors like DNA repair.

The Human Genome Project (HGP) and Microarray Technology in Cancer

A detailed and precise knowledge of each individual gene and its regulatory elements has contributed (along with other knowledge) to the identification of a number of possible anticancer targets.

Genetic Susceptibility to Cancer

While *familial* cancers do form a high percentage of the total cancer burden, they remain a source of misery to the affected families. The screening for mutations in *Brcal* I and *Brcal* II genes in breast cancer families is an established management strategy in the West.

The Department of Biotechnology has initiated a 'People of India' project to characterize the genetic make up of these groups with reference to their ethnicity. It is expected that this research will lead to the identification of suitable genetic markers (e.g.. single nucleotide polymorphisms and microsatellites) that indicate cancer susceptibilities of different populations.

Infections

Approximately 20% of the cancers among men and women in developing countries is attributable for infectious agents as opposed to 9% in developed countries (Pisanil 1997). Hepatitis Viruses (B and C) and the Human Papilloma Virus (HPV) which are involved in liver and cervical cancers respectively. The Hepatitis B vaccine is thus an important vaccine for cancer prevention. Vaccine for HPV is at the experimental stage, however this knowledge could be useful for prevention of illness.

Human T Cell Leukaemia Viruses I and II have been shown to be involved in outbreaks of T cell leukemia especially in Japan.

Other Causative Factors

Cancer is a group of diseases with similar characteristics. Cancer can occur in all living cells in the body and different cancer types have different natural history. Epidemiological studies have shown that 70- 90% of all cancers are environmental. Lifestyle related factors are the most important and preventable among the environmental exposures.

Tobacco consumption either as chewing tobacco or smoking tobacco is associated with all types of cancers in men whereas dietary practices, reproductive and sexual practices etc. will account for 40% of cancers. Appropriate changes in lifestyle can reduce the mortality and morbidity from a good proportion of Cancer, DM and Cardiovascular diseases.

Tobacco

Tobacco is the most important identified cause of cancer and is responsible for about 40 to 50% of cancers in men and about 20% of cancers in women. India has the added burden of tobacco chewing which is more prevalent than smoking in many areas. Tobacco chewing has resulted in a huge burden of oral cancers and oral precancerous conditions. There are various other forms of tobacco use peculiar to certain geographic regions of India and these need special attention.

Diet

Diet is responsible for 10-70% of cancers. In India dietary habits may be responsible for about 10 to 20% of cancers. Dietary factors may enhance the role of other risk factors. Predominant among them are cancers of the upper aero-digestive tract (mouth, throat, esophagus and lungs), stomach, large intestine, and breast cancer in women. The changing dietary pattern particularly involving animal proteins, because of industrialization and westernization coupled with other habits like smoking and alcohol will lead to increase in the chronic disease burden especially cancer and cardiovascular diseases.

Pesticides

Increase incidence of cancer in Punjab particularly Malwa region a cotton belt where at least 15 different pesticides sprays which are acephate, dichloropropene, diuron, flucometaron, pendimethalin, tribufos, trifluralin). Due to high cost of cancer treatment in state people go to nearby states such as Rajasthan and Delhi. As 70-199 patients going to Bikanair daily using a particular trained ferried from Bhatinda to Bikanair locally named as "**cancer train**" (*Sengupta N. A Train ride to Cancer care. Time of India 2011*).

Education, Socioeconomic Status and health facilities

Lack of knowledge and many belief systems such as cancers are incurable leading to late presentation and poor treatment compliance. Lack of trained oncologist, supporting staff, family dislocation for cancer treatment to a new city, cost of medical burden make the compliance to treatment poor. Comorbidity such as malnutrition, poor hygiene and sanitation, infection such as TB, Malaria, Measles causing immunocompromised states lead to poor tolerance to chemotherapy (Arora at al 2005).

Cancer of the head and neck

The main risk factors for these cancers are tobacco and alcohol. A diet rich in green and yellow vegetables has been shown to offer protection against oral cancer.

Cancer of the stomach

Japanese has the highest rate of stomach cancers of the world and the rates in Japanese migrants have dropped to very low levels as that of Americans when they migrated to the United States. This is clear evidence of the dietary pattern and risk of stomach cancer. The advent of refrigeration has dramatically reduced stomach cancer incidence as it has revolutionized food preservation. Consumption of large amounts of red chilies, food at very high temperatures and alcohol consumption are the main risk factors for stomach cancer in India. Consumption of a tobacco extract '*Tuibur*' has been linked to the high rates of stomach cancer in Mizoram. Primary prevention is the best strategy for prevention of stomach cancer.

Cancer of the large intestine

Heavy consumption of red meat can lead to risk of colon cancer. In South India there is a trend towards increasing consumption of red meat and this can lead to increased risk for large bowel cancer.

Cancer of the breast in women

Breast cancer is emerging as the leading cancer in women. A large number of factors are identified as risk factors for breast cancer such as late age at first pregnancy (greater than 30 years), single child, late age at menopause, etc. A high fat diet is also identified as a risk factor. Physical activity is found to be protective for breast cancer. The sudden changes towards affluent life styles have reduced the physical activities to a minimum and increased the consumption of diets rich in fat. Regular breast self examination by women is a very good way of detecting breast cancer in early stages and improve the cure rate.

Cervical Cancer

In cervical cancer, (cancer of the *uterine cervix*), cancer develops in the tissues of the cervix, which is a part of the female reproductive system. The cervix connects the upper body of the uterus to the vagina. The *endocervix* (the upper part which is close to the uterus) is covered by glandular cells, and the *ectocervix* (the lower part which is close to the vagina) is covered by squamous cells. The *transformation zone* refers to the place where these two regions of the cervix meet (American Cancer Society 2009).

There are several types of cervical cancer, classified on the basis of where they develop in the cervix. Cancer that develops in the ectocervix is called *squamous cell carcinoma*, and around 80-90% of cervical cancer cases (more than 90% in India) are of this type [WHO/ICO Information Centre on HPV and Cervical Cancer (a)]. Cancer that develops in the endocervix is called *adenocarcinoma*. In addition, a small percentage of cervical cancer cases are mixed versions of the above two, and are called *adenosquamous carcinomas or mixed carcinomas*. There are also some very rare types of cervical cancer, such as small cell carcinoma, neuroendocrine carcinoma etc. According to the Cervical Intraepithelial Neoplasia (CIN) system, mild to moderate dysplasia are as CIN1, intermediate dysplasia as CIN2, and severe dysplasia and carcinoma in situ are together classified as CIN3. The Bethesda system simplifies it further, by classifying CIN1 as Low Grade Squamous Intraepithelial Lesion (LSIL), and both CIN2 and CIN3 as High Grade Intraepithelial Lesion (HSIL) (Alliance for Cervical Cancer Prevention, Cancer Research UK).

The International Agency for Research on Cancer (Lyon, France) recognized Human Papillomavirus (HPV) as the 'necessary' cause of cervical cancer and HPV types 16 and 18 as carcinogenic agents for humans based on the strong and consistent associations between the infections and the disease (Bosch et al 2002). The recognition of the etiologic role of carcinogenic HPV types paved the way for a novel primary prevention strategy against cervical cancer through vaccines targeting the virus. India ranking number one globally in terms of cervical cancer burden has an estimated 134,420 new cases of cervical cancer every year and 72,825 deaths from the disease (WHO 2010). In spite of some reduction in incidence in recent years in the urban population, possibly owing to raised average age at marriage, reduction in number of child births and high number of hysterectomies, the fact remains that the disease is the leading cancer killer of Indian women of reproductive age. A comprehensive approach to cervical cancer prevention and control involving health education, vaccinating girls before initiation of sexual activity, screening women for precancerous lesions and treatment before progression to invasive disease can significantly reduce the morbidity and mortality from the disease.

Global Burden

According to WHO 2009; GLOBOCAN 2002 database, IARC, cervical cancer was the 5th most common cause of cancer death among women in the world, and had:

- 489,000 new cases
- An age-standardised incidence rate (global) of 16 per 100,000 women in 2002
- 1-year prevalence of 381,033, and 5-year prevalence of 1.41 million in 2002
- 268,000 deaths (3.6% out of 7.4 million cancer deaths)
- 9 age-standardized deaths per 100,000 in 2002
- 3,719,000 DALYs (disability adjusted life-years)

Burden in India

In 2004, cervical cancer was the third largest cause of cancer mortality in India, and had:

- An age-standardised incidence rate of 30.7 per 100,000 women in 2002
- 1-year prevalence of 101,583, and 5-year prevalence of 370,243 in 2002
- 72,600 deaths (nearly 10% out of 729,600 cancer deaths)

- 6.5 deaths per 100,000
- 9.5 age-standardized deaths per 100,000
- 987,000 DALYs
- 88 DALYs per 100,000
- 113 age-adjusted DALYs per 100,000

Cancer of the uterine cervix is still the most common cancer among women in India. Improvements in living standards and access to health have reduced the rate of occurrence of cervical cancer in certain States like Kerala. However the changing sexual behavior in young adults might lead to another wave of cervical cancers. Early age at first intercourse, multiple sexual partners, poor sexual hygiene, repeated child birth, smoking, human papilloma viral infection, etc. are some of the risk factors for cervical cancer. Regular cervical cytology examination (papsmear) by all women who have initiated sexual activity can prevent the occurrence of cervical cancer.

Table 22.3 : Cost of Breast Cancer

Direct cost (*n*=221)	In INR	Percentage of total cost of illness (direct cost + indirect cost)
Total screening cost	4,147,700.00	3.98
Total hospitalization cost*	28,200,041.00	27.05
Total radiotherapy cost	6,963,220.00	6.68
Total drug cost	37,766,768.00	36.23
Total consultation cost	2,002,940.00	1.92
Total medical cost	79,080,682.00	75.87
Total nonmedical cost (transportation, food, and lodging)	3,558,980.00	3.41
Total direct cost	82,639,662.00	79.28
Indirect cost		
Total wage loss of the patients	2,068,475.73	1.98
Total wage loss of the caretakers	4,804,447.84	4.61
Expenditure on hired help	707,000.00	0.68
Productivity loss	14,014,584.40	13.44
Total indirect cost	21,594,507.97	20.72
Total cost of illness		
Direct cost + indirect cost	104,234,170	100

*Cost of hospitalization also includes cost of surgery

Cost of Cancer

According to some analysis of expenditure on breast cancer by Jain & Mukherji 2016, the direct cost is maximum incurred. It is given in table 22.3. The public expenditure on cancer in India remain $10/person (as compared with more than $100/ person in high income countries with an equivalent number of cancer patients). Out of pocket payments, which account for more than 3/4 of the cancer expenditure in india, are one of the greatest threats patients and their families. Cancer diagnosis is increasingly responsible for catastrophic health expenditure.

Symptoms for Screening

If someone notice following symptoms she/he should contact to a health center immediately:

- A sore that doesn't heal
- Recent change in a wart or mole
- Unusual bleeding or discharge
- Persistent cough or hoarseness of voice
- Persistent change in bladder/bowl habits
- Difficulty in swallowing
- Painless lump or swallowing

NATIONAL CANCER CONTROL PROGRAM

The Cancer Control Program was started in 1975-76 as a central sector project. It was renamed as the National Cancer Control Program (NCCP) in 1985 and revised in 2004.

Objectives

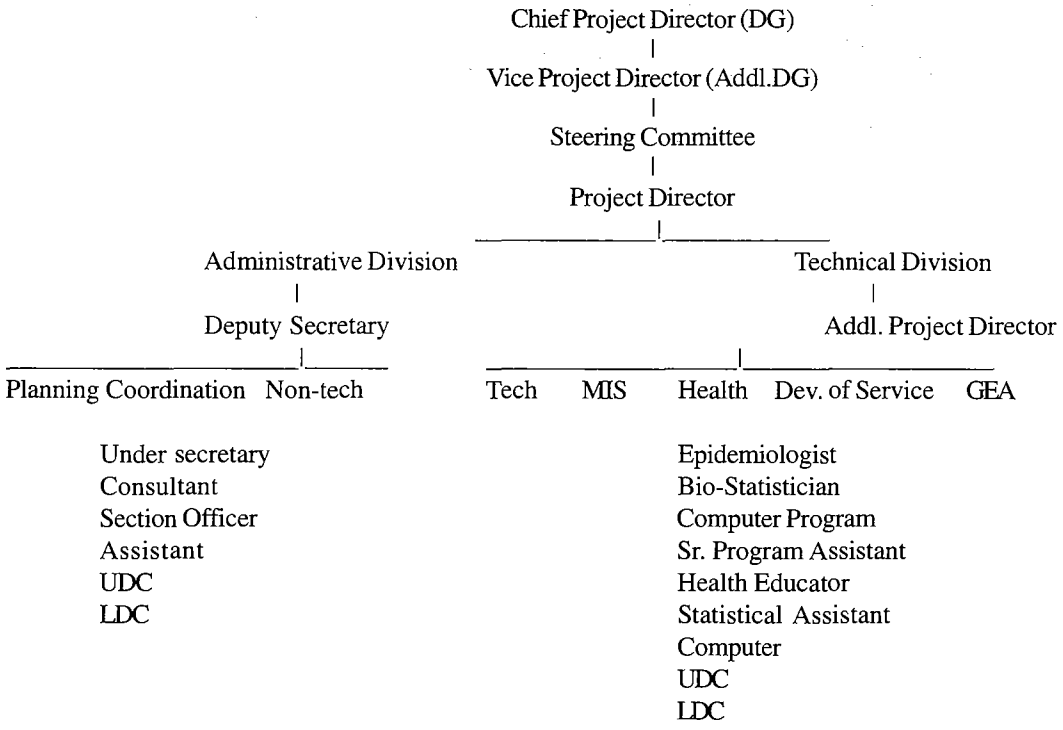
1. Primary prevention of cancers by health education regarding hazards of tobacco consumption and necessity of genital hygiene for prevention of cervical cancer.
2. Secondary prevention by early detection and diagnosis of cancers, for example, cancer of cervix, breast cancer and the oropharyngeal cancer by screening methods and patients' education on self examination methods.
3. Strengthening of existing cancer treatment facilities, which were inadequate.
4. Palliative care in terminal stage cancer.

Strategies

1. Prevention and early detection of cancers through district cancer control activities and strengthened IEC campaign.

Figure 22.1

NCCP MANAGEMENT CHART



2. To promote 'centers of excellence' in the field of cancer management with support to existing RCC of 20 years of proven track record by providing financial assistance.
3. To augment comprehensive cancer care facilities across the country through institutional capacity building in new and existing regional cancer centers and through new and existing oncology wings.
4. Development of early diagnostic capabilities in districts hospitals.
5. Encouraging public private partnership.
6. Increase capacity for palliative care in cancer.
7. Promote research in cancer that would be relevant to cancer control in India.
8. Capacity building and training of all personnel in cancer prevention and early detection to be done for all categories in phased manner.
9. Health education of the general public through use of audio, video, and print media regarding prevention and early detection of cancers.
10. Promote innovations in cancers care and indeginization of cancer treatment equipments.

Organizational Structure

It is at two levels-Central Government and State Government-with linkage through the Central Council of Health. It is suggested that respective executive committees should be assisted by a newly constituted National Cancer Control Board at the central and state levels by the corresponding Cancer Control Boards. The full time officer in-charge of cancer control is an oncologist who head the Cancer Control Cell at the Directorate General of Health Services (Figure 22.1).

SCHEMES UNDER THE PROGRAM

1. Recognition of New Regional Cancer Centers and Strengthening of Existing Regional Cancer Centers

There are 27 regional cancer research centers in India at present. Their main functions are: Cancer Detection and Diagnosis; Provision of therapy; After care and rehabilitation; Preventive Measures with emphasis on health education especially for tobacco related cancers; Training of paramedical and medical staff; and Research (fundamental and applied).

Coordination with the medical colleges and the general health infrastructure is the essential feature. The core requirements of a Regional Cancer Center are divisions of surgical oncology, radiation oncology, and medical oncology with support from department of anesthesiology, pathology, cytopathology, hematology, biochemistry and radiodiagnosis with appropriate equipment and staff. Regional centers are getting one time grant of Rs. 3 crores for further strengthen under the revised program. New regional cancer centers are being recognized and one time grant of Rs. 5.00 crores is being given.

Cobalt Therapy Installation

One crore for Non-Govt. and 1.5 crore for Government institution per unit for cobalt therapy unit and other radiotherapy equipment have been brought under this scheme. Financial assistance of Rs. 30 lacs for mammography unit is also available to the institutions having cobalt units.

2. Oncology Wings in Medical Colleges

The target of the National Cancer Control Program is to develop **Oncology wings** in all medical colleges in the country. Medical Colleges would form an important link between the regional centers on one hand, and the more peripheral health infrastructure (District Hospitals, *tehsil* Hospitals, PHCs) on the other hand. Financial assistance has been released for medical colleges / hospitals for installation of cobalt therapy units and Rs. 3 crore per institution has been provided under this scheme for the same. There are 350 radiotherapy machines located in more than 210 institutions across the country.

3. District Cancer Control Program

This Program was launched in 1990-91 and under this Program each state and union territory has been advised to prepare their projects on health education, early detection, and pain relief measures. This program will be run by regional centers or an oncology wing. A cluster of 3 congruent districts are developed for preventive activities through oncology wing or regional centers. For this they get up to Rs. 90 lakh spreading over a period of five years. The district program has five elements:

1. Health education,
2. Early detection,
3. Training of medical & paramedical personnels,
4. Palliative treatment and pain relief,
5. Coordination and monitoring.

The District Programs are linked with Regional Cancer effective functioning each district where program is started have one District Cancer Society that is chaired by local Collector/Chief Medical Officer. Other members are Dean/Principal of medical college, *zila parishad* representative, NGO representative, etc.

Research and Training

Training manuals for health professionals, cytology, palliative care and tobacco cessation have been developed under the program for capacity building in cancer control at the district level.

4. Voluntary Organization

Assistance of Rs.5.00 lakh has been provided to NGOs for the purpose of undertaking IEC and early detection activities in cancer. NGOs will implement these activities under the coordination of the nodal agency, which will be regional center or oncology wing. A grant of Rs. 8000.00 per camp will be provided for organizing for IEC and early detection activities.

Implementation

The pilot project was started in the states of Bihar, Tamil Nadu, Uttar Pradesh and West Bengal under the direct supervision of the state Regional Cancer Centers. Twenty rural blocks in each of the states of Bihar and Uttar Pradesh and ten rural blocks in each of the states of Tamil Nadu and West Bengal were selected to implement the pilot project. For each block 20 female noncommunicable disease (NCD) workers have been selected and these workers play a pivotal role in the success of the project. The workers had cleared their secondary level of education and are mostly from the villages or the localities where the project is being implemented. The survey questionnaire was designed and translated into the respective regional languages to collect demographic data and other information concerning the knowledge, attitude and practices about cancer and other common diseases. The questionnaire has been designed in such a way so as to get information about the accessibility of the population to primary health care and the quality of services rendered by these centers. The NCD workers have been making house to house visit, registering women within the age group of 20 to 65 years and

filling up the questionnaire forms. They also discussed the early symptoms of the common cancers with the women and advise the symptomatic women to go for medical check up.

For the selected NCD workers 2-3 days of intensive training programs were organized in small groups by the respective supervising regional cancer centers. They were trained to fill up the questionnaire proforma, advise women about healthy life style, ill effects of tobacco and to detect the early symptoms of common cancers as well as the symptoms of tuberculosis and blindness. Each worker was given a target of filling up 100 forms every month.

For every 10 blocks, 5 medical officers and 1 consultant doctor have been recruited. Their responsibilities were to guide and supervise the NCD workers and to examine the women referred by the workers. They also scrutinize the filled up forms to ensure completeness of the forms and good quality of data. The regional cancer centers have set up early cancer detection clinics in the community either in their own peripheral extensions or in the primary health centers of the area where the Project is running. The medical officers make regular visits to these clinics to examine the suspected cases referred by the NCD workers based on the symptoms. This has given the Pilot Project an entirely new dimension by linking community-based awareness with early cancer detection facilities. Instead of running the cancer control program as a separate vertical health program it should ideally be integrated into the existing primary health care set up so as to make the program most cost effective. This program is now comes under NRHM.

The charitable and private sector has been mobilized to participate in cancer control activities through recognition of NGOs or private health care facilities in cancer care.

There is regular monitoring of NCCP implementation through review meetings, visits, etc. However, National Integrated Disease Surveillance Program has included the risks of cancer for surveillance.

New Initiatives

There are various activities, which are carried out under the National cancer control program:

- India has become the member of International Agency for Research on Cancer (IARC).
- Onconet-India: Telemedicine project to connect 27 RCCs and each RCC with 4 to 5 peripheral centers is being operationalized and C-DAC Trivandrum is also involved.
- Training of cytopathologists and cytotechnicians in the quality assurance in Pap smear technology.
- Participation in Health *Melas* and distribution of health education material.
- Postage stamp depicting 'Breast Self Examination' was brought out by Department of Posts on National Cancer Awareness Day. National cancer Awareness day is celebrated on the birth anniversary of Nobel Laureate Madam Curie, 7th Nov.
- Telecast of a health magazine '*Kalyani*' in the current year with cancer and anti tobacco items under the agreement with Prasar Bharti & MOHFW.
- Broadcast of health education audio material developed by CNCI, Kolkatta, through FM Radio.

Community Based Cancer Control Program carried out with the help of WHO:

- Training of health care personnel at district level in early detection and awareness of cancer.
- Telemedicine in cancer.
- IEC activities including National Cancer Awareness Day celebrated on 7th November, the birth anniversary of Madam Curie.

NATIONAL CANCER REGISTRY PROGRAM

Cancer registration is the process of systematically and continuously collecting information on malignant neoplasm. Broadly, there are two types of cancer registries-Hospital and Population based. National wide registries operate in some countries, e.g., England, Nordiac Countries, Canada, Australia, Cuba, Israel, New zealand, while in most of the countries only small proportion of population is covered by population based cancer registries, e.g.., India, Italy.

National Cancer Registry Program was launched in 1982 by Indian Council of Medical Research (ICMR) to provide true information on cancer prevalence and incidence.

Objectives

1. To generate reliable data on the magnitude and patterns of cancer
2. Undertake epidemiological studies based on results of registry data
3. Help in designing, planning, monitoring and evaluation of cancer control activities under the National Cancer Control Programme (NCCP)
4. Develop training programmes in cancer registration and epidemiology.

With these objectives three Population Based Cancer Registries (PBCRs) at Bangalore, Chennai and Mumbai and three Hospital Based Cancer Registries (HBCRs) at Chandigarh, Dibrugarh and Thiruvananthapuram were commenced from 1 January 1982. The PBCRs have gradually expanded over the years and as of now there are 25 PBCRs under the NCRP network.

As a whole, all the 25 registries have a coverage of only 7.45% of the total country's population. These registries generate annual reports which indicate the annual incidence of particular cancer in the population which help in the planning and evaluation of cancer control. From these registries, trends are indicating to put more emphasis on cancer prevention. Operational wing at ICMR, headquarter in Delhi and Technical wings at Delhi and Mumbai have to coordinate the functions and review and monitor them regularly.

The overall risk of cancer for all the regions ranged 1-8 to 1-27 and one in 10 to one in 25 for males and females, respectively, for all the sites in the lifetime. The highest incidence of cancer at all sites for males was 273 per 100,000 persons and for females, it as 227 per 100000 persons as observed in the northeastern region (Table 22.4) (Asthana et al 2015).

CANCER ATLAS

An extensive area remain uncovered, therefore the picture of cancer in several urban and most rural areas remain unknown. To bridge the gap, a project development of an Atlas of the Cancer in India was started under WHO-ICMR since 2003 mainly to have an idea of patterns of cancers in several parts of country. Under this program the Indian Council of Medical Research has developed an Atlas of cancer in India based on the information collected for the year 2001-02 from 105 collaborating centers to have an idea of the pattern of cancer across the country.

CANCER VACCINE

Cancer vaccines are intended either to treat existing cancers (therapeutic vaccines) or to prevent the development of cancer (prophylactic vaccines). Both types of vaccines have the potential to reduce the burden of cancer. Treatment or therapeutic vaccines are administered to cancer patients and are designed to strengthen the body's natural defenses against cancers that have already developed. These types of vaccines may prevent the further growth of existing cancers, prevent the recurrence of treated cancers, or eliminate cancer cells not killed by prior treatments. Prevention or prophylactic vaccines, on the other hand, are administered to healthy individuals and are designed to target cancer-causing viruses and prevent viral infection.

The vaccine triggers mainly the cellular antitumoral immune responses which enable a complete destruction of different malignant and benign tumors. The vaccine possesses the vast and strong antitumoral properties due to a unique combination of telomerase

Table 22.4: Cancer incidence (all sites) in both sexes from 25 PBCRs in India.

Registry location	AARs of incidence		One out of the total number of persons who developed cancer	
	Male	Female	Male	Female
North	125.2	120.6	13	11
South	113.7-132.6	91.6-137.2	13-17	11-15
Central	105.9	105.6	15	13
East/ North East	69.5-273.4	56.1-227.8	8-24	10-23
West	43.7-117.5	56.6-103.0	14-29	13-21
Rural West	51.8-74.2	51.6-62.6	19-27	21-25
All regions	43.7-273.4	51.6-227.8	8-27	10-25

Source: NCRP Report 2009-11

antigen imitators together with more than 40 other tumor specific antigen imitators in its composition. The antigens, which are imitated by the drug, are present in cells of the most common malignant and benign tumors containing fibrotic and glandular tissues. When the drug is introduced into an organism, a numerous clones of antitumoral lymphocytes are formed. In those cases when thus formed antitumor immunity could achieve a complete destruction of the tumors, relapses do not occur, due to the formation of the immunological memory. The chances of the complete destruction of a tumor depend on:

1) Number of tumor cells (size of a tumor) and their mitotic activities;
2) Type of tumor- histological structures, antigen structures, the number of HLA-A class molecules on tumor cells;
3) Initial state of the immune system.

In the treatment of the malignant tumors it is most effective as an antimetastatic drug, when used in combination with surgical resection of a primary tumor which, depending on the stage of the cancers, results in to a complete destruction of tumor in 30-90% of cases. The drug does not render any toxic effect in normal cells of an organism, has no mutagenic and teratogenic effect and does not contain any cells and tissues of tumors. The main components of the vaccine are glycoproteins which imitate particular fragments of tumor antigens.

One such vaccine is Resan, an antitumoral agent ready for marketing. The indications of this vaccine are:

1. Usage of the drug as vaccines for preventing the formation of tumors in healthy people, in people with heritable anamnesis- vaccination of the patients so called "a group of risk" i.e. in those cases where the tumors are not yet visible but the tumor markers are higher than in normal (elevated levels of one or more of the following tumor markers: CA15-3, CA19-9, CA50, CA72-4, CA125, CA195, CA242, CA549, CA-SCC, CYRFA21-1, MUC-1, BCM, MCA, PSA, DU-PAN-2).
2) For preventing relapses of malignant tumors after radical operation.
3) Usage as antimetastatic drug in a combination with surgical resection of a primary tumor - destroys the metastases of size up to 10-50 cm^3 (depending on the histological structure). It is recommended to start to inject the drug 7-12 days before the operation.
4) Usage of the drug as an immunotherapy of benign tumors, of sizes up to 10-70 cm^3, containing fibrotic tissues (fibromas, fibroadenomas, fibromyomas) and glandular tissues (adenomas, glandular polyps) as well as for preventing malignancy of benign tumors.
5) The treatment of the mastopathy (dishormonal hyperplasia of breast) and breast cancer, endometriosis and myoma of uterus in women. In these cases the immunotherapy is necessary to carry out 2 weeks prior to menses.
6) The treatment of the benign prostatic hyperplasia, autoimmune thyroiditis and diffuse goitre.

Gardasil Vaccine: Another example is the human papillomavirus (HPV) that is associated with nearly all cases of cervical cancer. Preventing HPV infection is expected to dramatically reduce the risk of cervical cancer. One promising vaccine is targeted at two cancer causing HPV types that account for approximately 70 percent of cervical cancer cases worldwide (HPV types 16 and 18). This vaccine has been shown to be highly protective against persistent infection over a two to four year period. Large-scale human trials are currently underway to confirm these early findings and to determine the efficacy of the vaccine in protecting against the precancerous cervical lesions known as cervical intraepithelial lesions or CIN. According to the Crisis Card, Australia has the lowest cervical cancer mortality rate, which is due to the successful rollout of a comprehensive package of HPV vaccines, treatment and prevention. According to the Government of Australia, there has also been a decline in genital warts and cervical abnormalities among young women since the introduction of the HPV vaccine in Australia.

In boys and young men ages 9 to 26, Gardasil helps protect against 90% of genital warts cases. Gardasil is administered intramuscularly in the deltoid region of the upper arm or in the higher anterolateral area of thigh in 3 separate 0.5 ml doses over 6 months.

WHO, United Nations Populations Fund (UNFPA), International Union Against Cancer (UICC), International Federation of Gynecologists and Obstetricians (FIGO) and other organizations that

influence public health policies globally have unanimously endorsed HPV vaccines as an effective cancer prevention option. The Strategic Advisory Group of Experts (SAGE) on immunization, which reports to the Director-General of WHO on issues ranging from vaccine research and development to immunization delivery, surmised that the introduction of vaccines is likely to bring great benefits worldwide, particularly to those developing countries where cervical cancer is a major cause of death, and screening programs are limited or absent. [32] It is time that the health policy makers in the countries with high cervical cancer burden like India, make an informed decision and seriously consider the introduction of both HPV vaccination and organized screening as part of comprehensive cervical cancer control program (Basu et al 2013).

The single cancer vaccine licensed by the Food and Drug Administration in USA is a prophylactic vaccine against hepatitis B virus, an infectious agent associated with liver cancer. This vaccine is already introduced in National Immunization Schedule in India also.

Provenge is an autologous cellular immunotherapy indicated for the treatment of asymptomatic or minimally symptomatic metastatic castrate resistant (hormone refractory) prostrate cancer. It is given in 3 doses at 2 weeks interval and each dose contain 50 million autologous CD54+ cells activated with Prostatic acid Phosphatase Granulocyte Macrophage colony Stimulating Factor.

Comments

1) Gaps in health system management.

2) Shortage of cytologists and pathologists.

3) Lack of multi-sectoral integration.

4) Use of unsustainable technology.

5) Lack of integration with the primary health care system.

6) Inadequate and inequitable coverage.

7) Lack of a coordinating national strategy

8) Research and Training was one of the objectives of the program was neglected significantly. The clinical presentations, patterns of distribution, types, outcomes and health seeking behavior are varied for Indian patients than other developed nations. There could be different risk factors involved in India and need to be studied. Promotion of such applied and community research is lacking in the program. Community has various myths and misconceptions regarding cancer causation, presentation and treatment which affects the health seeking behavior and outcome (Kishore 2005; 2006, European Commission 1987). To remove these misconceptions a comprehensive program is required. Even medical professionals are not practicing the guidelines for pap smear screening.

9) Mapping cancer patterns in the country (Cancer Atlas) with the help of WHO funding was a success but ICMR has to fund such projects (TOI 28th Aug 2007). More funding is required not only for cancer registry but also for epidemiological research on various aspect of cancer in India.

DIABETES

INTRODUCTION

Non Communicable Disease (NCDs), especially Cardiovascular disease (NCDs), Diabetes Mellitus, Stroke and Chronic Lung Disease have emerged as major public health problem in India, due to increase in aging population and environmentally driven changes in behavior. The premature morbidity and mortality in most productive phase of life is posing a serious challenge to Indian society and economy. It is estimated that in 2005 NCDs accounted for 5,466,000 (53%) of all deaths (10,362,000) in India. The estimated burden of common NCDs are: 2.4 million Ischemic Heart Disease, 37.8 million diabetes, 2.4 million cancers and 0.93 million stroke.

According to the World Economic Forum (2010), among the three most populous countries in the world, it is estimated that (in international dollars) China will forego $558 billion, the Russian Federation $303 billion and India $237 billion in national income between 2005–2015 as a result of premature deaths caused by heart disease, stroke and diabetes alone.

DIABETES

Diabetes is a chronic disease caused by inherited and /or acquired deficiency in production of insulin by the pancreas or in its effects. As a result of this there is increased concentration of glucose in the blood. In one form, the pancreas fails to produce the insulin that is

essential for survival. However, noninsulin-dependent diabetes is much more common. This form of diabetes occurs principally in adults and results from the body's inability to respond properly to the action of insulin. Malnutrition-related diabetes has also been described from some developing countries, like India. The classification of diabetes is (Report 1997) as follows:

1. Type 1 Diabetes Mellitus
   - Autoimmune
   - Idiopathic
2. Type 2 Diabetes Mellitus
   - Non-obese
   - Obese
3. Other specific types of diabetes due to pancreatic diseases, endocrine diseases, endocrinopathies, drugs and chemical induced, infections, immune mediated, genetic syndrome,
4. Impaired glucose tolerance and impaired fasting glucose
5. Gestational diabetes mellitus

Diabetes is the second commonest chronic disease in childhood occurring in 1 in every 1500 children by age 5 and 1 in 350 children in age 8 (Sterling 2002). Prasanna Kumar et al (2008) from south India which has looked at type 1 diabetes patients up to 25 years of age. The incidence of type I diabetes has been low 3.8 per 100,000 person years but the burden of diabetes is great. Only 20.7% patients in the study could achieve A1c <7% and 11.8% had complications many also had growth problems. This study highlighted some of the complexities of management of type 1 diabetes.

World

The rapid rise of noncommunicable diseases represent one of the major health challenges to global development in this century. Four of the most prominent noncommunicable diseases are cardiovascular diseases, cancer, Chronic Obstructive Pulmonary Disorder (COPD) and diabetes. They are linked by common preventable risk factors related to life style. According to the latest WHO estimates 171 million people world wide having diabetes and this figure is likely to be more than double by 2030. Around 3.2 million deaths occur every year, which is due to complication of diabetes; one in 20 deaths is attributable to diabetes, i.e. 8700 deaths every day and six deaths every minute. The top ten countries in numbers of sufferers are India, China, USA, Indonesia, Japan, Pakistan, Russia, Brazil, Italy, and Bangladesh. Overall direct health care costs of diabetes range from 2.5% to 15% of annual health care budgets. Because of its chronic nature the severity of its complications and the means required to control them are enormous.

Globally the prevalence of childhood obesity varies from over 30% in USA to less then 2% in sub-Saharan Africa. Currently the prevalence of obese school children is 20% in UK and Australia, 15.8% in Saudi Arabia, 15.6% in Thailand, 10% in Japan and 7.8% in Iran (Al Nuaim et al. 1996; Mo-Suwan et al 1993).

India

The most recent assessment carried out by ICMR estimated that there are 66.58 million cases and 2.26 million DALYs loss due to diabetes. Indian studies showed prevalence of diabetes mellitus ranging from 2.1% in New Delhi to 12.4% in Kerala while rural areas showed lower rates. Over a period of time it seems that the prevalence has increased because it was 2.1% in 1972 and 12.1% in 2001 (Pradeepa et al 2002, Dwivedi & Krishna 1999). Some Southern Indian studies showed a 40% increase in prevalence over a period of 6 years (Ramachandran 1997). In a National Urban Diabetes Survey in 2000, it was found that Hyderabad had 16.6% of diabetes, Chennai 13.5% and Bangalore 12.4%. In most of metros and cities of India presently 10-15% of population is having diabetes. Percentage of deaths is significantly higher among diabetic subjects (11.9%) compared to nondiabetic subjects (3.3%).

National representative data for childhood obesity in India is unavailable, however available studies in Chennai and Delhi has shown prevalence of 6.2% and 7.4% respectively (Vedavathi et al 2003; Kapil 2002). 50-80% of obese children will continue as obese adults (Styne 2001) and fall into risk group of Diabetes, Hypertension, Coronary heart Disease and many more obesity related diseases. Complications of adult obesity are made worse if the obesity begins in childhood. In studies conducted in South India and Delhi, the prevalence of obesity among school children was reported to be 6-7.4% (Vedavathi et al 2003; Kapil 2002). According to Kumar et al (2007) 8.4% of girls and 4.1% of boys had diabetes.

Risk factors for diabetes are obesity and weight loss, sedentary life style, stress and smoking. The most important aspect of diabetes is occurrence of complications that increases the cost of management. Diabetes is a costly disease not only for affected individuals & their families, but also for health systems. Studies in India estimate that for a low income family with an adult with diabetes, as much as 25% of family income may be devoted to diabetes care. Heart disease in diabetes is 21.4%, neuropathy 17.5%, peripheral vascular disease 6.3%-30% (Bal 2002) Retinopathy 19.0%, and Microalbuminea 26.3% (Pradeepa 2002). A diabetic patient spent Rs. 4510 per year and for foot care the cost increases to Rs. 7200 per year (Sobhana 2000, 2001).

Diabetics have extra burden of mental and social suffering. It is found that 30-60% of diabetics are suffering from depression. Such condition may further worsen the treatment compliance. This is more common in women above 40 years. Diabetes cuts 7.5 years of life in males and 8.2 years of life in females if diagnosed at 50 or more years of age (Franco et al. Arch Internal Medicine June 2007).

Clinical Features

Patient of diabetes has following symptoms:

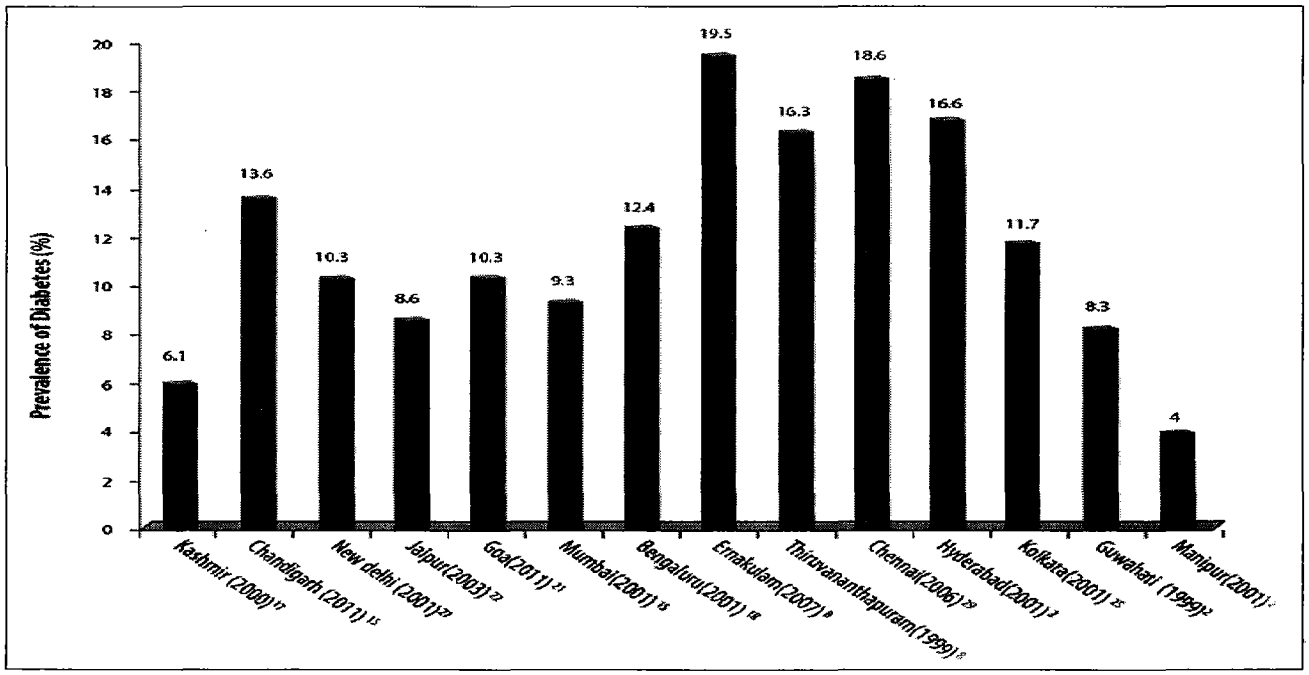
- Excessive thirst,
- Excessive urination,
- Unexplained weight loss,
- Excessive hunger,

Complications are common in diabetes. Most of the times patients present with one or more complications when it comes to light that he/she is having diabetes. The causes of increased cardiovascular deaths among diabetic subjects are multiple and include elevated glucose and blood pressure, dyslipidemia, renal disease, smoking and inflammation (Mohan et al 2006). The skin lesions commonest in uncontrolled diabetes are ulcer ano and fungal infections.

Tests for diabetes are estimation of blood or urine glucose level. WHO classifications on the basis of blood glucose level is as follow:

Time	Glucose Concentrations in mol/L (mg/dl)		
	Whole blood		Plasma
	Venous	Capillary	Venous
Fasting	>6.1(110)	>6.1 (110)	>7 (126)
2 hr PP	>10 (180)	>11.1(200)	>11.1 (200)

Figure : Prevalence of DM in different parts of the country



Source: Baruah et al. Indian J Endocr Metab 2014

Preventive Measures

Primary prevention, healthy diet and regular physical activity, protect susceptible individuals. Preventive measures have an impact by reducing or delaying both the need for diabetes care and the need to treat diabetes complication. Recent studies have established lower limits for ideal BMI for Asian populations. It was shown for urban Indian population that at a BMI of > 23 kg/m^2 the risk for diabetes was significant for both genders. Therefore the healthy BMI for an Indian is definitely below 23 kg/m^2. This has been confirmed by studies from other parts of India and in migrant Indians, and also from other Asian populations. According to the World Health Organization recommendations a BMI of 18.5-22 kg/m^2 has been considered healthy for Asian populations (WHO 2000).

Secondary prevention includes early detection and good treatment. The treatment of high blood pressure and raised blood lipids as well as the control of blood glucose level can substantially reduce the risk of developing complications and slow their progress. Tertiary prevention includes control of devastating complication of diabetes through early detection and proper treatment. Achieving population level impact in the prevention of diabetes is a complex task that requires, resources, competent leadership and a diverse staffing mix at the National, State and provider levels. The role of patients, doctors and government in management of diabaties is given in table 22.3

The drugs listed in the NLEM and IPHS are adequate for the management of the vast majority of people with diabetes, therefore most of the casses can be managed at the PHC level and subcenters can be involved in management of followup cases (Table 22.4).

Association of DM with TB and HIV

There are important associations between DM and TB. DM, both type 1 and type 2, increases the risk of TB by a factor of two or three, and 2012 estimates put the number of adult TB cases associated with DM at just over one million. Persons with dual disease have worse TB treatment outcomes, with delayed sputum culture conversion and an increased risk of death, treatment failure or recurrent TB after successful treatment completion. Conversely, TB, like other infections, can worsen blood glucose control and complicate the clinical management of DM. Therefore there is need of integration of preventive and management strategy.

CARDIO AND CEBEBRO-VASCULAR DISEASES

BURDEN OF DISEASE

Coronary heart disease (CHD) is epidemic in India and one of the major causes of disease-burden and deaths. Mortality data from the Registrar General of India shows that cardiovascular diseases are a major cause of death in India now. Studies to determine the precise causes of death in urban Chennai and rural areas of Andhra Pradesh have revealed that cardiovascular diseases cause about 40% of the deaths in urban areas and 30% in rural areas. Analysis of cross-sectional CHD epidemiological studies performed over the past 50 years reveals that this

Table 22.3 : Role of patients, doctors and government in management of T2DM

Level	Risk factors	Actions
Patients	Low birth weight	Diabetes education
	Poor nutrition	Community support & Participation
	Sedentary lifestyle	Life style modifications
	Poor disease awarensss	
Doctor	Improper approach	Impriving compliance to treatment
	Lack of updated guidelines knowledge	Early identification of those at risk
	Inertia in initiating insulin	Promoting & adopting healthy lifestyle
		Prevention of diabetes complications
Government	Poor quality services	Dedicated nationalwide drive against DM
	High treatment cost	Upgrading healthcare infrastructure
		Promoting diabetes research and Education

Table 22.6 : Diabetic care at various levels of healthcare system

Level (NLEM)	Primary		Secondary	Tertiary	
Level (IPHS)	Sub center	PHC	CHC	SDH	DH
Manpower	Health workers	At least one MBBS	1 MD/DNB general medicine	At least one MD/DNB general medicine	2-5 MD medicine (based upon bed strength), 1 dietician
Responsibilities	Health promotion	+ treatment	+ diagnosis and treatment	Diagnosis and treatment of DM; refer GDM if necessary	
Diagnostics	Blood sugar	Blood sugar	Urine acetone; blood sugar	Urine acetone; blood sugar	Urine acetone; blood sugar; glycosylated hemoglobin
Oral drugs (NLEM)	Metformin 500 mg Glibenclamide 2.5, 5 mg				
Oral drugs (WHO)	Metformin 500 mg Gliclazide				
Insulin (NLEM)	Soluble, intermediate Premix 30-70				
Oral drugs (IPHS)		Glibenclamide 2.5,5 mg Metformin 500 mg	Daonil 5 mg Metformin 500 mg	Biguanide, chlorpropamide 100 mg, tolbutamide 500 mg, glibenclamide	
Insulin (IPHS)		Soluble insulin	Insulin, insulin zinc suspension	Insulin Lente basal Inj insulin rapid, Inj cry insulin Inj mixtard (desirable)	
Oral drugs (NPCDS)	Metformin				
Insulin (NPCDS)	Insulin regular, insulin intermediate				
Suggested availability (by authors)	None	Metformin, premixed insulin, basal insulin sulfonylurea	Metformin, sulfonylurea, alpha glucosidase inhibitor, pioglitazone; metformin+sulfonylurea FDC; all insulin		

All generic and trade names are listed exactly as mentioned in various documents. NPCDS: National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke, NLEM: National List of Essential Medicines, WHO: World Health Organization, IPHS: Indian Public Health Standards, PHC: Primary health care, CHC: Community Health Centre, SDH: Sub-divisional Hospital, DH: District Hospital, FDC: Fixed dose combination

Source: kalra et al 2015

condition is increasing in both urban and rural areas. Prevalence of coronary heart disease (CHD) increased from 1% in 1960 to 9.6% in the year 1995 among urban Indian residents. Similarly, the prevalence in rural residents rose from 2% in 1974 to 3.74% 1995. The prevalence of CHD is now reported to be 3-4% in rural areas and 8-10% in urban areas among adults. Based on these data, it is estimated that there were approximately 29.8 million patients with CHD in the year 2003. With an estimated 10% attrition and event rates they projected an annual new event or death to occur in 2.9 million persons per year with nearly 1.5 million people dying due to CHD every year.

In a national mortality survey the causes of deaths in more than 113,000 subjects from1.1 million homes were analyzed using a validated verbal autopsy instrument as reported earlier [Dhingra et al 2010]. CVD were the largest causes of deaths in males (20.3%) as well as females (16.9%) and led to 1.7 – 2.0 million deaths annually. Prevalence studies report that CHD diagnosed using history and ECG changes have trebled in both urban and rural adults from early 1960s and current prevalence rates are 10 – 12% in urban and 4 – 5% in rural adults [Gupta et al 2008]. Stroke is also increasing in India [Gupta et al 2008] and incidence registries using population – based surveillance have reported that annual incidence of stroke varies from 100 – 150/100,000 population in urban locations with greater incidence in rural regions [Bhattacharya S et al. 2005, Benerjee TK, et al 2001, Dalal PM, et al 2008, Sridharan et al 2009].

Prevalence rate of rheumatic heart disease in India has decreased significantly but remain one of the risk for other heart diseases (Table 22.5). The diagnosis of RF has been established according to Jone's criteria: Major manifestations - carditis, arthritis, subcutaneous nodules, erythema maginatum and chorea; minor manifestations - fever, arthralgia, elevated sedimentation rate, C-reactive protien, prolonged PR interval in ECG. Two major or one major and two minor

Table 22.5: Comparative Data of rheumatic heart disease from India

Author	Place	Year	Age (Year)	Prevalence (per 1000)
ICMR	Delhi	1982-1990	5-15	2.9
Padmavati	Delhi (Urban)	1984-1994	5-10	3.9
Grover et al	Raipurrani	1988-1991	5-15	2.1
Avasthi et al	Ludhiana	1987	6-16	1.3
Patel et al	Anand	1986	8-18	2.03
Lalchandani et al	Kanpur	2000	7-15	4.54
Jose & Gomathi	Vellore	2001-02	5-18	0.68
Perwal et al	Rajasthan	2006	5-18	0.67

manifestations should be present to establish the diagnosis. The disease is common in unhygienic and poor socioeconomic conditions.

The common risk factors for other heart problems are Tobacco, Alcohol, Diet and Physical inactivity and hence the population prevalence levels of these factors can predict the future disease burden.

In one of the studies in urban area of South India it is found that adolescents in the age group of 15-19 years had prevalence of hypertension as 8.5% (Male 9.4% and Female 7.5%) which should be considered as serious if not treated properly (Suudarssanane et al 2006).

In India, 47% of the male and 14% of the female population use tobacco in some form, resulting in nearly 1 million premature deaths annually. The total economic cost of the three major diseases due to tobacco use in India was Rs. 308 billion in 2002-03. India has played a leading role in the development of Framework Convention on Tobacco Control (FCTC) and was one of the first countries ratifying the convention. Cost-effective interventions exist, and have worked in many countries: the most successful strategies have employed a range of population-wide approaches combined with interventions for individuals. WHO estimates that an additional 2% annual reduction in chronic disease death rates in India over the next 10 years would result in an economic gain of 15 billion dollars for the country. India is passing through an epidemiological and demographic transition and the pace of transition varies between states. The policies will have to be flexible to accommodate the differing needs and resources of the states in India.

Stroke

Cerebrovascular disorders particularly stroke are the global problems of enormous proportion. In 1999 cerebrovascular disease accounted for 50 million DALYs worldwide, representing 3.4% of all DALYs (WHO 2000). Projections to the year 2020 show that 61 million DALYs are likely to be lost due to cerebrovascular disease each year, with more than four-fifths occurring in the developing countries (Murray et al. 1996). Stroke burden in India has been rising in the last few decades, in contrast to developed countries where it has plateaued or decreased. The average annual incidence rate of stroke in India currently is 145 per 100,000 population which is higher than some of the western countries. An analysis of community surveys from different regions of India, showed a crude prevalence rate of strokes of about 203 per 100,000 population above 20 years of age amounting to a total of about 1 million cases (Anand K et al 2001). Rapid socioeconomic changes have led to changes in people's life style, smoking, work related stress, altered food habits and the risk of developing hypertension, diabetes and hyperlipidemia. Urbanization also affecting lifestyle of people. This coupled with increased lifespan has resulted in increased in the incidence of stroke. Indians may also be genetically prone for stroke due to high prevalence of metabolic syndrome. In India 10%-15% of strokes occurs in people aged below 40 years. Upto 80% of the strokes in India are ischemic in nature, among which intracranial atherosclerosis is the most common mechanism (Kaul et al 2009).

Hypertension

Cardiovascular diseases caused 2.3 million deaths in India in the year 1990; this is projected to double by the year 2020. Hypertension is directly responsible for 57% of all stroke deaths and 24% of all coronary heart disease deaths in India. Indian urban population studies in the mid-1950s used older WHO guidelines for diagnosis (BP > or =160 and/or 95 mmHg) and reported hypertension prevalence of 1.2-4.0%. Subsequent studies report steadily increasing prevalence from 5% in 1960s to 12-15% in 1990s. Hypertension prevalence is lower in the rural Indian population, although there has been a steady increase over time here as well. Recent studies using revised criteria (BP > or =140 and/or 90 mmHg) have shown a high prevalence of hypertension among urban adults: men 30%, women 33% in Jaipur (1995), men 44%, women 45% in Mumbai (1999), men 31%, women 36% in Thiruvananthapuram (2000), 14% in Chennai (2001), and men 36%, women 37% in Jaipur (2002). Among the rural populations, hypertension prevalence is men 24%, women 17% in Rajasthan (1994). Hypertension diagnosed by multiple examinations has been reported in 27% male and 28% female executives in Mumbai (2000) and 4.5% rural subjects in Haryana (1999). There is a strong correlation between changing lifestyle factors and increase in hypertension in India. The nature of genetic contribution and gene-environment interaction in accelerating the hypertension epidemic in India needs more studies. Pooling of epidemiological studies shows that hypertension is present in 25% urban and 10% rural subjects in India. In another study conducted on 4608 women it was found that 39.2% (32% in rural and 48% in urban). The awareness about hypertension was 42.8% (24.6% rural and 56.8% urban). Of these 38.6% of the women were on treatment and of those treated, controlled blood pressure was observed in 21.5% (Gupta R 2011). At an underestimate, there are 31.5 million hypertensives in rural and 34 million in urban populations. A total of 70% of these would be Stage I hypertension (systolic BP 140-159 and/or diastolic BP 90-99 mmHg). Recent reports show that borderline hypertension (systolic BP 130-139 and/or diastolic BP 85-89 mmHg) and Stage I hypertension carry a significant cardiovascular risk and there is a need to reduce this blood pressure. In one study on elderly screening for hypertension at primary health care setting it was found that 33% in above 50 year population and increased with age. Population-based cost-effective hypertension control strategies including high risk screening should be developed (Gupta 2004, John 2010).

PREVENTIVE MEASURES

Control of risk factors has led to 50 – 80% decline in incidence of CVD in high income countries. WHO has classified prevention as population based primordial, individual – based primary and patient based secondary prevention [WHO 2005]. The population approach is used to address the behavioral risk factors at the community level and its success depends on surveillance, population – wide education, partnerships with community organizations, assurance of health services, environmental change and policy and legislative initiatives. This approach addresses a selected list of modifiable risk factors such as diet, smoking and tobacco use, sedentary lifestyle, and availability of screening and diagnostic services. The high risk individual – based prevention approach should assess risk factors to determine individuals risk. Secondary prevention strategies, on the other hand, comprise mainly medical interventions in addition to therapeutic lifestyle changes.

Social determinants of health are very important for primordial, primary and secondary prevention and policies at the government level influence all.

Primordial Prevention

Rose showed that all pathophysiological factors were continuously distributed in a population [Rose G 1992]. He opined that high-risk and sick individuals simply represented the extreme end of the statistical distribution. From this hypothesis evolved the concept of population-wide control of risk factors. This would shift the mean levels of risk factors in the standard normal curve to the left and decrease number of high – risk individuals. The policy and clinical actions for population actions for prevention are summarized below.

Improving socioeconomic environment and literacy

The social issues involved in occurrence of premature CVD and other non – communicable diseases are multiple and include the social gradient, stress, early life events, social exclusion, improper working

conditions, lack of social supports, addictions including tobacco/alcohol, food scarcity or excess and uneven distribution, lack of proper transport and illiteracy and low educational status. There are macrolevel (governance failure, geo-politics, natural resources decline, economic policies, population growth, demographic trap, etc.) and microlevel (cultural barriers, poverty trap, lack of innovation and savings, absence of trade/business, technological reversal, adverse productivity shock, gender bias, adolescence-related, etc.) factors. Multiple national programs exist in India to improve socioeconomic status of the population ranging from literacy improvement (National Literacy Mission and Right to Education Act) to employment generation (National Rural Employment Guarantee Act) and social security (Women's Health Plan). These policies are directed to the specific social issue or population group but not in context of disease prevention or control. Improving literacy reduces unhealthy behaviors (e.g., smoking) and increases awareness of risk factors. It also promotes adherence to lifestyle and pharmacotherapies for primary and secondary prevention.

National Rural Health Mission of government of India should focus on improvement of healthcare systems for non-communicable diseases and chronic care.

Healthcare financing and universal insurance

In India the total healthcare spending is about 5% of the gross national product (GNP) but government spends less than 1% of GNP. Treating CHD is expensive but unfortunately all the focus of the government is on development of tertiary care facilities. It is possible to reduce the mortality and burden of CHD by population wide policies. Health insurance for acute and chronic diseases in virtually non-existent in India. More than 80% population pays out of pocket for health related expenses and every year almost 30 million individuals are pushed into poverty for catastrophic healthcare expenditure.

Changing medical education curriculum

Primordial and primary prevention of chronic non-communicable diseases especially CVD and CHD are not major component of medical school curricula in India. Continuing medical education for general physicians, general practitioners and other about advances in cardiovascular and other forms of therapy should be mandatory. Training of healthcare workers and allied health professionals for systematic or opportunistic screening is important (WHO 2007, Shah 2006, Smith 2004). To early diagnosis of risk factors and their management.

Tobacco control

It is now well recognized that smoking in any form (cigarettes, bidis and others) as well as use of non-smoked tobacco is equally dangerous to health, especially CVD health (Teo etal 2006). Smoking and tobacco use is rampant among the rural subjects and in low socioeconomic status urban subjects (Gupta 2006). Studies from Europe and North America have reported that strict enforcement of FCTC have resulted in reduced admissions due to CHD and decreased mortality (Berrechietal 2006).

Healthy diet, salt and alcohol control

WHO has concluded that as a society moves up the socioeconomic scale there are substantial changes that occur in diet (WHO 2002). These include greater consumption of calories, fats, saturated fats, trans-fats, salt, refined carbohydrates and sugars and decreased intake of high-fibre foods, legumes and vegetables. It is suggested: (i) increased intake of fruits and vegetables (at least 500 g per day), legumes and whole grain foods; (ii) reduction of the intake of fried foods, processed foods; (iii) limitation on the daily intake of total fat to 25–35% of calories, and saturated fat <7% of the calories, by limiting the use of butter, ghee, full-fat dairy products, trans-fats, and tropical oils (palm oil and coconut oil) and increased intake of mono-unsaturated fats up to 20%; (iv) reduction of the dietary glycemic load by cutting down on the carbohydrates, especially refined carbohydrates; (v) reduction of the intake of salt to <2.5 gm sodium or <6 gm of salt (one teaspoon of salt) per day; and (vi) moderation in the use of nuts, lean meat and fish and alcohol.

Policies for physical activity

Regular physical activity is extremely important for CVD prevention. The recommended physical activity is 30-to-45 minutes of moderate-intensity activity such as brisk-walking every day. Habit of active participation in physical activity programs, games and sports begins in early childhood and track to adulthood, therefore, physical education should be given greater emphasis

in schools and colleges (Kalzetal 2009, Shahetal 2010). The current development of cities has been haphazard and most are conglomeration of houses and narrow lanes with no place to walk safely (Frumkin 2002). For CVD prevention there should be encouragement of construction and use of foot-paths and bicycle paths.

Primary and secondary prevention

As a policy, preventive healthcare and chronic disease surveillance should be delivered by primary care physicians or trained community health workers.

Risk factor control

Aggressive primary prevention is critical to preventing CVD in those who are in high-risk category with the four key objectives: (i) avoidance of all tobacco products and passive exposure to tobacco, (ii) control of dyslipidemia, (ii) control of blood pressure, and (iii) control of blood glucose and diabetes through intense lifestyle modification and medications if necessary (WHO 2005).

Secondary prevention

Acute cardiovascular disease management and appropriate long term medical care is crucial in preventing CVD related mortality. There is need to develop better quality CVD care systems and manpower in these countries. Guidelines recommend that lifestyle changes recommended above, aspirin, beta-blockers, angiotensin converting enzyme (ACE) inhibitors and statins be used in all patients with CVD.

Implementing policy interventions

Healthcare policy implementations requires partnerships between multiple stakeholders. This is also true for CVD prevention and control. There is need for integrated approach to policy making with participation of ministries of health, finance, commerce, industry, social development, rural and urban development, transport, agriculture, food and civil supplies, education human development, information and broadcasting, telecommunications, drugs and chemicals and some others. Planning ministry should act as a nodal point for all activities.

The strategic approaches and operational elements for prevention and control of CVD and diabetes are thus similar and closely interlinked, whether it is primordial prevention (preventing the acquisition of risk factors in the first place), primary prevention (preventing onset of disease by reducing risk factors which are elevated) or secondary prevention (reducing the risk of complications after the onset of disease). It is utmost important to create awareness among public about the risk factors of diabetes, CVD and stroke ant their prevention in order to reduce the associated mortality and morbidity. The NPDCS will be implemented in a phased manner.

PROGRAM OF NCDs

Aims

- Prevention and control of common NCD risk factors through an integrated approach
- Reduction of premature morbidity and mortality due to diabetes Mellitus, and Stroke.

Objectives

Long term

1. Reduce prevalence of risk factors of common NCDs
2. Reduce morbidity and mortality due to diabetes, Cardiovascular disease and Stroke
3. Building capacity of health systems to tackle NCDs and improvement of quality of care.

Immediate

1. Primary prevention of major Non communicable diseases through Health Promotion
2. Surveillance of NCDs and their risk factors in the population
3. Capacity enhancement of health professionals and health systems for diagnosis and appropriate management of NCDs and their risk factors.
4. Reduction of risk factors of NCDs in the population
5. Establish National Guidelines for management of NCDs
6. Development of strategies/ policies for prevention of NCDs in the country through Inter-ministerial collaborations/ coordination.
7. Community empowerment for prevention of NCDs

Guiding Principles

Strategies

A. Health promotion

- Media package development
- Strengthening IEC for community awareness

- Targeted interventions at specific settings like workplaces, schools, rural, urban and peri-urban areas.

B. Professional Education

- Appropriate modification of medical education/ health professionals
- Initiation of new /applied courses.
- Continuing medical education.

C. Diagnosis and management

- Training of health professionals at all levels of health care including primary, secondary and tertiary levels for early detection and appropriate management and referral.
- Strengthening of health infrastructure including equipments at all levels of health care for early detection and appropriate management and referral
- Adequate and appropriate logistic support like supply of drugs and consumables /transport/ maintenance of equipments, etc.

D. Community Participation

- Involvement of Panchayati Raj Institutions and district administration in the districts for promotion of healthy lifestyles.
- involvement of ASHA workers for IEC, prevention and early detection and appropriate referral.
- involvement of anganwadi workers in IEC, preventive activities and also linkages with the primary health care.

2006-2007

- Establishment of National NCD Cell with the necessary manpower and infrastructure support
- Establishment of state NCD Cell in 6 states
- Identification and establishment of 6 Regional Resource Centres
- Identification of one Medical college
- Identification of one district under each Medical college for setting up of District Healthy Lifestyle centres and Strengthening of District and Subdistrict health facilities
- Finalization of Management Guidelines for NCDs and their risk factors.
- Preparation and Dissemination of IEC strategy,
- Health promotion in specific settings:
- Rural/ urban/ periurban/ schools /workplaces
- Survey for factors/ NCDs

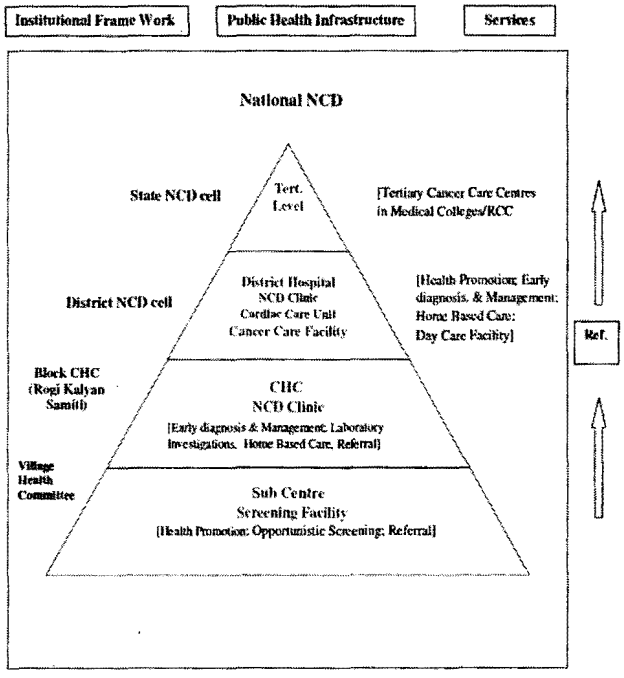
NCD Cell at the center

For planning, coordination and guidance of national program central hub for NCD will be established that will provide database and resources for training and IEC. That will also monitor and evaluate internally and externally the program. Similarly at the state level the NCD cell will be established with a designated nodal officer that would facilitate, coordinate and monitor the NCD control activities in the state.

Comments

Older people tend to have higher absolute cardiovascular risk status, as there is increasing trend towards higher blood pressure with increasing age and are therefore likely to gain substantially by reduction of blood pressure but there is no provision to screen all elderly population. If screening for hypertension is provided by the primary care workers all elderly can be covered in 2 years without upsetting routine work (WHO 2002, John et al 2010). There is need of increasing male workers at the subcenter level who should give attention to communicable and noncommunicable diseases during his home visits.

Underlying causes of NCDs may be addressed through a three-tier population approach (see figure). Many NCDs are amenable to the treatment of their manifestations and symptoms and the control of their progression (first tier). However, a large proportion of the burden caused by NCDs is preventable. The



prevention of risk factors through low-cost, multisectoral interventions, both within primary health care and outside of the health sector, is more cost-effective than treatment. Furthermore, these risk factors often coexist within the same population groups and interact with one another. These risk factors also interact with social, economic and environmental determinants. One level of action is to move from a single-disease-specific curative to integrated preventive approaches that concurrently address common health risk factors (second tier). For example, alcohol and tobacco consumption, coupled with an unhealthy diet and physical inactivity, has an impact on the prevalence of cardiovascular diseases.

Such preventive and integrated approaches create conditions that are conducive to broader initiatives that go beyond the simple absence of disease to the promotion of health in the spirit of the 1986 Ottawa Charter for Health Promotion (third level). In that context, health promotion was referred to as enabling people to increase control over, and to improve, their health, which was understood as the "state of complete physical, mental and social well-being". To that effect, health promotion "is not just the responsibility of the health sector, but goes beyond healthy life-styles to well-being".

GLOBAL ACTION PLAN FOR THE PREVENTION AND CONTROL OF NONCOMMUNICABLE DISEASES 2013–2020

As per report of sixty sixth world health assembly, the General Assembly on the Prevention and Control of Non-communicable Diseases, acknowledged that the global burden and threat of noncommunicable diseases (NCDs) constitutes one of the major challenges for development in the twenty-first century. A WHO global action plan for the prevention and control of noncommunicable diseases 2013–2020 has been developed (WHA 66). This comprehensive global monitoring framework, including 25 indicators and a set of nine voluntary global targets, will track the implementation of the action plan through monitoring and reporting on the attainment of the voluntary global targets in 2015 and 2020. The indicators of the global monitoring framework and the voluntary global targets provide overall direction and the action plan provides a road map for reaching the targets.

The framework provided in this action plan needs to be adapted at the regional and national levels, taking into account region-specific situations and in accordance with national legislation and priorities and specific national circumstances.

Vision statement

A world free of the avoidable burden of noncommunicable diseases.

Goal

To reduce the preventable and avoidable burden of morbidity, mortality and disability due to noncommunicable diseases by means of multi-sectoral collaboration and cooperation at national, regional and global levels, so that populations reach the highest attainable standards of health, quality of life, and productivity at every age and those diseases are no longer a barrier to well-being or socioeconomic development.

Overarching principles and approaches

1) Human rights approach
2) Equity-based approach
3) National action and international cooperation and solidarity
4) Multi sectoral action
5) Life-course approach
6) Empowerment of people and communities
7) Evidence-based strategies
8) Universal health coverage
9) Management of real, perceived or potential conflicts of interest

A total of 6 objectives have been given as follows:

Objective 1

To raise the priority accorded to the prevention and control of noncommunicable diseases in global, regional and national agendas and internationally agreed development goals, through strengthened international cooperation and advocacy.

The desired outcomes of this objective are strengthened international cooperation, stronger advocacy, enhanced resources, improved capacity and creation of enabling environments to attain the nine voluntary global targets

The governments are supposed to achieve the target through:

1) **Advocacy:** Generate actionable evidence and disseminate information about the effectiveness of interventions or policies to intervene positively on linking noncommunicable diseases into existing policies

2) **Broader health and development agenda:** Promote universal health coverage as a means of prevention and control of noncommunicable diseases, and its inclusion as a key element in the internationally agreed development goals
3) **Partnerships with non-governmental organizations (NGOs)**

Objective 2

To strengthen national capacity, leadership, governance, multisectoral action and partnerships to accelerate country response for the prevention and control of noncommunicable diseases.

Governments have the lead responsibility for ensuring that appropriate institutional, legal, financial and service arrangements are provided for the prevention and control of noncommunicable diseases. Universal health coverage, primary health care approach and social protection mechanisms are important tools to protect people from financial burden of noncommunicable diseases and to provide access to health services for all, in particular for the poorest segments of the population. The desired outcomes of this objective are strengthened stewardship and leadership, increased resources, improved capacity and creation of enabling environments for forging a collaborative multisectoral response at national level.

The governments are supposed to achieve the target through:

1) **Enhance governance:** Integrate the prevention and control of noncommunicable diseases into health-planning processes and development plans, with special attention to gender equity and the health needs of people living in vulnerable situations.
2) **Mobilize sustained resources**: Strengthen the provision of adequate, predictable and sustained resources.
3) **Strengthen national noncommunicable diseases programmes**
4) **Conduct needs assessment and evaluation**
5) **Develop national plan and allocate budget to** prioritize budgetary allocations for addressing surveillance, prevention, early detection and treatment of noncommunicable diseases and related care and support, including palliative care.
6) **Strengthen institutional capacity and the workforce**

Objective 3

To reduce modifiable risk factors for noncommunicable diseases and underlying social determinants through creation of health-promoting environments.

Governments should be the key stakeholders in the development of a national policy framework for promoting health and reducing risk factors. At the same time, it must be recognized that the effectiveness of multisectoral action requires allocation of defined roles to other stakeholders. Further supportive environments that protect physical and mental health and promote healthy behaviour need to be created.

Objective 4

To strengthen and orient health systems to address the prevention and control of noncommunicable diseases and the underlying social determinants through people-centred primary health care and universal health coverage.

The actions outlined under this objective aim to strengthen the health system including the health workforce, set policy directions for moving towards universal health coverage and contribute to achieving the voluntary global targets listed below as well as the premature mortality target. It calls upon the fact:

- At least 50% of eligible people receive drug therapy and counselling to prevent heart attacks and strokes
- An 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major noncommunicable diseases in both public and private facilities.
- A 25% relative reduction in the prevalence of raised blood pressure or contain the

prevalence of raised blood pressure, according to national circumstances.

The governments are supposed to achieve the target through:

1) **Leadership**
2) **Financing:** Shift from reliance on user fees levied on ill people to the protection provided by pooling and prepayment. Develop local and national initiatives for financial risk protection and other forms of social protection (for example through health insurance, tax funding and cash transfers and the consideration of health savings accounts), covering prevention, treatment, rehabilitation and palliative care
3) **Expanded quality services coverage**
4) **Human resource development**
5) **Accessibility**

Objective 5

To promote and support national capacity for high-quality research and development for the prevention and control of noncommunicable diseases.

The agenda prioritizes (i) research for placing noncommunicable diseases in the global development agenda and for monitoring; (ii) research to understand and influence the multisectoral, macroeconomic and social determinants of noncommunicable diseases and risk factors; (iii) research to enable expensive but effective interventions to become accessible and be appropriately used in resource-constrained settings. The governments are suppose to increase the investment in research, innovation and development and develop, implement and monitor in collaboration with academic and research institutions, as appropriate, a national policy and plan on noncommunicable-disease-related research alongwith capacity strengthening.

Objective 6

To monitor the trends and determinants of noncommunicable diseases and evaluate progress in their prevention and control.

This will be done by developing an effective monitoring and surveillance system.

Voluntary global targets

(1) A 25% relative reduction in the overall mortality from cardiovascular diseases, cancer, diabetes, or chronic respiratory diseases
(2) At least 10% relative reduction in the harmful use of alcohol, as appropriate, within the national context
(3) A 10% relative reduction in prevalence of insufficient physical activity
(4) A 30% relative reduction in mean population intake of salt/sodium
(5) A 30% relative reduction in prevalence of current tobacco use in persons aged 15+ years
(6) A 25% relative reduction in the prevalence of raised blood pressure or contain the prevalence of raised blood pressure, according to national circumstances
(7) Halt the rise in diabetes and obesity
(8) At least 50% of eligible people receive drug therapy and counselling (including glycaemic control) to prevent heart attacks and strokes
(9) An 80% availability of the affordable basic technologies and essential medicines, including generics, required to treat major non-communicable diseases in both public and private facilities

References -Cancer

Annual report of Ministry of Health & Family Welfare 2000-1. New Delhi

Arora B, et al. Childhood cancer: Perspective in India. JIMA 2005; 103 (9): 479-81.

Available from: http://apps.who.int/hpvcentre/statistics/dynamic/ico/country_pdf/IND.pdf. Updated in September 2010.

Baruah MP et al. A revisit to prevailing care and challenges of managing diabetes in India: Focus on regional disparities. Indian J Endocr Metab 2014; 18: 254-63

Basu P, Benerjee D et al. Efficacy and safety of human papillomavirus vaccine for primary prevention of cervical cancer: A review of evidence from phase III trials and national programs. South Asian J Cancer 2013; 2: 187-92.

Bosch FX, Lorincz A, Muñoz N, Meijer N, Shah KV. The causal relation between human papillomavirus and cervical cancer. J Clin Pathol 2002; 55;244-65.

European Commission Survey 1987-Europeans and prevention of cancer: a working document of the services of the European Commission, Brussels. in: Heller T, Davey Bailey L, Editors. reducing the risk of cancers. 1st Ed London: Hodder & Stoughton 1989; 10-1.

Ferlay J, Bray F, Pisani P, et al. Globocan 2002: Cancer incidence, mortality and prevalence worldwide, IRAC Cancer base 5. Version 2.0: Lyon: International Agency for Research on Cancer 2004.

Gajalakshmi V et al. Lancet 2003; 362:507-15.

GLOBACAN 2002 database, International Agency for Research

on Cancer, World Health Organisation. Available at http://www-dep.iarc.fr/, last accessed November 18, 2009
Government of India. National Cancer Control Program - India. Nuclear Medicine Division, Ministry of Health and Family Welfare, New Delhi.
Government of India. Annual Report 2005-2006 and 2009-10. Ministry of Health & Family Welfare, GOI, New Delhi.
ICMR. Assessment of Burden of Noncommunicable Disease. ICMR New Delhi 2004.
ICMR. Cancer research in ICMR. http//www.icmr.nic.in. 2000.
ICMR. National Cancer Registry Program. Biennial report 1988-89: An Epidemiological Study. ICMR, New Delhi 1992.
Jayant K et al. Improved stage at diagnosis of cervical cancer with increased cancer awareness in a rural Indian population. International Journal of Cancer, 1995, 63: 161-163.
Jayant K et al. Survival from cancer in Barshi registry, rural India. In: Sankaranarayanan R, Black RJ, Parkin DM, eds. Cancer survival in developing countries. Lyon, International Agency for Research on Cancer, 1988: 69-77 (IARC Scientific Publications).
Kishore J, Irfan Ahmad. Myths about cancers. Rationalist Voice May June 2004.
Kishore J, Irfan Ahmad, PK Mohanta. "Beliefs and perceptions about cancers among patients attending Radiotherapy OPD" in Joint Conference of IAPSMand IPHA in Tirupati, India from 21-24th January 2006.
National Cancer Registry Program 1981-2001, an overview. ICMR, New Delhi 2002
Nair MK, et al. Cancer: Current scenario, intervention strategies and projections for 2015. National Commission on Macroeconomics and Health. Ministry of Health & Family Welfare, Govt. of India 2005.
National workshop on control of cervical cancer-alternative strategies. New Delhi, Institute of Cytology and Preventive Oncology, Indian Council of Medical Research, 2001.
Naveen DR Dsouza et al. Projection of Cancer Incident Cases for India -Till 2026. APJCP 2013; 14 (7):4379-4386.
Pariwal KL, Gupta BK, Panwar RB, et al. Prevalence of rheumatic heart disease in school children in Bikaner: an echocardiographic study. J Assoc Physician India 2006; 54: 279-82.
Pisami P, et al. Cancer and infection: estimates of the attributable fraction in 1990. Cancer epidemiol Biomarkers Prev 1997; 6: 387-400.
Prasad R. India has highest incidence of gall bladder, mouth and lower pharynx cancer. The Hindu daily Newspaper 2005; Jan 30th: 11.
Sankaranarayanan R et al. Performance of visual inspection after acetic acid application (VIA) in the detection of cervical cancer precursors. Cancer, 1998, 83: 2150-2156.
Sankaranarayanan R et al. Visual inspection as a screening test for cervical cancer control in developing countries .In: Franco E, Monsonego J, eds. New developments in cervical cancer screening and prevention. Oxford, Blackwell Science, 1997: 411- 421.
Sankaranarayanan R et al. Visual inspection with acetic acid in the early detection of cervical cancer and precursors. International Journal of Cancer,1999, 80: 161-163.
Tilakaratue WM et al. Oral Oncol 2005; Nov 24.
Working Group report on National Cancer Control Program strategies for tenth plan. Directorate General of Health Services. Ministry of Health & Family Welfare. Govt. of India.
World Health Organisation. The Global Burden of Disease: 2004 Update. Geneva, WHO, 2009b. Death and DALY estimates for 2004 by cause for WHO Member States. Available at http://www.who.int/healthinfo/global_burden_disease/estimates_country/en/index.html.

References -other NCD

Albati KG, et al. Definition, diagnosis, classification of Diabetes mellitus and its complications. Part I: Diagnosis and Classification of DM. Provisional report of a WHO consultation. Diabet Med 1998; 15:539-553.
Al-Nuaim AR, Bamgboye EA, al Herbish A.The pattern of growth and obesity in Saudi Arabia male school children. International J Obesity 1996; 20: 1000-1005.
Anand K, et al. Estimation of mortality and morbidity due to stroke in India Neuroepidemiology 2001;20: 208-11.
Asthana S, Labani PS, Labani S. A review on cancer incidence in India from 25 population-based cancer registries. J NTR Univ Health Sci 2015;4:150-4.
Bal A. Diabetes foot: Magnitude of the problem. JIMA 2002; 100(3):155-157.
Banerji MA, Faridi N, Atluri R, Chaiken RL, Lebovitz HE. Body composition, visceral fat, leptin and insulin resistance in Asian Indian men. *J Clin Endocrinol Metab* 1999; *84* : 137-44.
Bartecchi C: Reduction in the incidence of acute myocardial infraction associated with a associated with a citywide smoking ordinance. Circulation 2006, 114:1490-1496.
Chandalia M, Abate N, Garg A, Stray-Gundersen J, Grundy SM. Relationship between generalized and upper body obesity to insulin resistance in Asian Indian men. *J Clin Endocrinol Metab* 1999; *84* : 2329-35.
Diabetes voice June 2004 Vol. 2004 Vol 49 issue 2
Dwivedi RN, Krishna G. Epidemiology of Diabetes in India. Ind J Community Medicine 1999; 24 (1): 40-44.
Frumkin H: Urban sprawl and public health. Public Health Rep 2002, 117:201-217.
Govt. of India. Annual Report 1997-98. Ministry of Health & Family Welfare, GOI, New Delhi.
Grover A, Vijayvergiya R, Thingam ST. Burden of rheumatic and congenital heart disease in India: lowest estimate based on the 2001 census. *Indian Heart J* 2002; 54: 104–107.
Gupta. Meta-analysis of prevalence of hypertension in India. Ind Heart J 1997;49:43-8.
Gupta R. Trends in hypertension epidemiology in India. J Hum Hypertens 2004; 18 (2): 78-8.
Gupta R. Recent trends in coronary heart diseases epidemiology in India. Indian Heart J 2008;60(2 Suppl B):B4-18.
Gupta R et al. Tranlating evidence into policy for cardiovascular disease control in India. Health Research Policy and System 2011; 98: Available from http://www.health-policy-system.com/content/9/1/8
Gupta R, et al. Epidemiology and causation of coronary health disease and stroke in India. Heart 2008; 94: 16-26.
Gupta R. trends in Hypertension epidemiology in India. J Hum Hypertenion 2004; 18: 73-78.

Gupta R: Smoking, educational status and health inequity in India.
Gupta R: Burden of coronary heart disease in India. Indian Heart J 2005, 57:632-638.
Hindu. Tighter strictures attempt to counter obesity/diabetes epidemic The Hindu 25 November 2008 also on www.oxha.org
ICMR. Assessment of burden of non-communicable diseases. ICMR New Delhi 2004.
ICMR. Pilot study on the feasibility of utilizing the existing school health services in Delhi for the control of RF/RHD. ICMR final report, 1990.
Jain M & Mukherjee K. Economic burden of breast cancer of the households of Punjab. Int J Med Public Health 2016; 6: 13-8.
James WPT, Chen C, Inoue S. Appropriate Asian body mass indices? Obesity Review, 2002; 3:139.
John J, Muliyil J, Balraj V. Screening for hpertension among older adults: A primary care "high risk" approach. Ind J Comm Med 2010; 35(1): 67-69.
Jose VJ, Gomathi M. Declining Prevalence of Rheumatic Heart Disease in Rural Schoolchildren in India: 2001–2002. Indian Heart J 2003; 55: 158–160.
Joshi P et aal. Risk factors for early myocardial infarction in South Asians compared with individuals in other countries. JAMA 2007; 297: 286-294.
Kapil U et al. Prevalence of obesity among affluent adolescents school children in Delhi. Indian Ped 2002; 39: 449-452.
Kalra S, et al. Strengthening diabtes management at primary health level. Indian J Endocr Metab 2015; 19: 443-7.
Katz DL: School based interventions for health promotion and weight control: not just waiting on the world to change. Annu Rev Public Health 2009, 30:253-272.
Kaul S, et al. Stroke burden and risk factors in developing countries with special reference to India 2009; 107: 358-70.
Prasanna Kumar KM, et al. incidence of type i diabetes mellitus and associated complications among children and young adults: results from Karnataka Diabetes registry 1995-2008. JIMA 2008; 106(11): 708-11.
Lalchandani A, Kumar HRP, Alam SM. Prevalence of rheumatic fever and rheumatic heart disease in rural and urban school children of district Kanpur [Abstr]. *Indian Heart J* 2000; 52: 672.
Mo-Suwan L et al. Increasing obesity in school children in transitional society and the effect of the weight control program. South East Asian J Tropical Medicine and Public Health 1993; 24: 590-594.
Mohan V, Shanthirani CS, Deepa M, et al. Mortality rates due to diabetes in a selected urban south Indian population-the Chennai Urban Population Study (CUPS-16). JAPI 2006; 54: 113-117.
Murray CJL, Lopez AD. The Global burden of disease. Ist Ed. Cambridge MA: Harvard School of Public Health 1996.
NCMH. National Commission on Macroeconomics and Health Report. Ministry of Health & Family Welfare, Govt. of India 2005.
Padmavati S. Present status of rheumatic fever and rheumatic heart disease in India. *Indian Heart J* 1995; 47: 395–398
Padmavati S. Prevention of Health Disease in India in the 21st Century: Need for a concerted effort. India Heart Journal 2002.
Patel DC, et al. Rheumatic fever and rheumatic heart disease in school children of Anand. *J Assoc Physicians India* 1986; 34: 837–839.
Planning Commission. Eleventh Five Year Plan (Draft). Government of India.
Pradeepa R, et al. Epidemiology of diabetes in India-Current perspective and future projection. JIMA 2002; 100 (3):144-148.
Prevention and Control of Diabetes (An Interview), Swasth Hind, 1991. XXXV (7):.184-5.
Ramachandran A, et al. Rising prevalence of NIDDM in an urban population in India. Diabetologia 1997; 40 : 232-237.
Registrar General of India. Population projection for India and States 1996-2016. New Delhi: Registrar General: 1996:91-94.
Report of the Expert Committee on the Diagnosis and Classification of Diabetes Mellitus. Diabetes Care 1997;20:1183-97.
Rose g. Strategy of Preventive Medicine Oxford. Oxford university Press 1992.
Shah B, Gupta R, Mathur P, Saxena M, Agarwal RP, Bhardwaj A: An action plan for non-communicable disease prevention, surveillance, management and control in economically deprived Indian states: Lessons from Rajasthan. South Asian J Prev Cadial 2006, 10:5-45.
Shah P: Improvement in health related knowledge and behavior of Asian Indian School children after intensive educative intervention: A comparative analysis with parents and teachers. Br J Nutr 2010.
Smith SC: Principles for national and regional guidelines on cardiovascular disease prevention: a scientific statement from the World Heart and Stroke Forum. Circulation 2004, 109:3112-3121.
Teo KK, Ounpuu S, Hawken S, Pandey MR, Valentin V, Hunt D, Diaz R, Rashed W, Freeman R, Jiang L, Zhang X, Yusuf S, INTERHEART study: a case-control study, Lancet 2006, 368:647-658.
Shobhana R, Roa PR, et al. Expenditure on health care incurred by diabetes subjects in developing country-A study from Southern India. Diabetes Research Clinical Practice 2000; 48:37-42.
Snehalatha C, Viswanathan V, Ramachandran A. Cutoff values for normal anthropometric variables in Asian Indian adults. *Diabetes Care* 2003; *26* : 1380-4.
Sobhana R, et al. Footcare economies-cost burden to diabetes patients with foot complications: A study from Southern India. JAPI 2001; 49: 530-33.
SuddaVedavathi S, et al. Prevalence of overweight and obesity in Affluent adolescent schools in Chennai in 1981 and 1998. Indian Pediatrics 2003; 40: 775-779.
Van Doorslaer E, S: Effects of payments for health care on poverty estimates in 11 countries in Asia: an analysis of household survey data. Lancet 2006, 368:1357-1364.
World Economic Forum (2010). Global Agenda Council reports 2010. Summaries of the Global Agenda Council discussions from the Summit on the Global Agenda 2009. Geneva, Switzerland.
WHO. Follow-up to the Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-communicable Diseases. Available

from http://apps.who.int/gb/ebwha/pdf_files/WHA66/A66_R10-en.pdf.
World Health Organization. Obesity: Preventing and managing the global epidemic. *WHO Tech Rep Ser* 2000; *894* : 1-253.
World Health Organization. The world health report 2000: Geneva 2000
World Health Statistics annual 1993. Geneva: WHO 2000.
World Health Organization. CVD risk management package for low and medium resource settings. Geneva: WHO 2002.
World Health Organization: Preventing chronic diseases: a vital agenda. Geneva: World Health Organization; 2005.
WHO expert consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. The Lancet, 2004; 157-163.
World Health Organization: Prevention of cardiovascular disease. Guidelines for risk assessment and management of cardiovascular risk Geneva, World Health Organization; 2007.
Wasir HS, Ramachandran P, Nath LM. Prevalence of hypertension in a closed urban. Ind Heart J 1984; 36:250-3.

CHAPTER 23

NATIONAL ANTI-TOBACCO PROGRAM

HISTORY OF TOBACCO

In the late fifteenth century Columbus while discovering America brought back tobacco with him and introduced it in Europe. King James of England in 16th century commented regarding smoking: "A custom loathsome to the eye, hateful to the nose, harmful to the brain, and dangerous to the lungs." The Portuguese brought it to India about four centuries ago. Some used tobacco as a medicine, while still others used it to drive away evil spirits. Although tobacco is a native plant of South America where it was used for ceremonial and medicinal purposes, it was only between the first and second World Wars that tobacco was commercially exploited. The "boom period" for tobacco industry matched with a sudden spurt in lung cancers and heart attacks. Availability of irrefutable scientific evidence on its health hazards from well-conducted cohort and case-control studies during 1950s supported the pleas for tobacco control. However, the anti-tobacco movement acquired a global nature after the publication of the official reports on the subject by the Royal College of Physicians (1962) and the US Surgeon General (1964).

Subsequently, thousands of scientific investigations have confirmed the association of smoking with various diseases (Table 23.1), and have provided additional evidence implicating cigarette smoking as a cause of coronary artery disease, stroke, obstructive airway disease, peripheral vascular disease, pregnancy complications including intrauterine growth retardation and a variety of neoplasms including cancers of oral cavity, larynx, oesophagus, urinary bladder, kidney, stomach, pancreas, cervix and more recently of hematopoietic system (USDHHS 1989, Doll 1994).

There is increase in the risk of deaths among TB patients and caused 200,000 extra TB deaths (Gupta 2003). *Gutka/Areca nut* causes oral submucosal fibrosis that lead to oral cancer (Tilakaratue WM et al 2005). Areca nut is known carcinogenic with sufficient evidence (IARC 2004). Similarly other diseases which are directly and indirectly related to tobacco are given in Table 23.2.

There is widespread misconception that *hukah* (hubbly bubbly) is less hazardous than cigarette smoke. According to WHO one hour with a hookah is equivalent to something between 100 and 200 cigarettes. The regular waterpipe smoker is exposed to larger amounts of nicotine, carbon monoxide and certain other toxins than the typical cigarette smoker. The force needed to pull the air through the hose allows the smoke to reach much deeper into the lungs. The chances of tuberculosis also increase manifolds among water pipe smokers (HT 13th Nov 2006).

Review of the health hazards of exposure to environmental tobacco smoke (or passive smoking) shows that it damages the respiratory tract of adults,

adversely effects the cardiovascular system and results in lung cancer (Wiebel 1997). Children of smokers have an increased frequency of respiratory and middle ear infections and are at risk of impaired lung function. Many hazardous substances have been identified in tobacco, but it has not been possible to identify all the components, which result into cancers or other diseases. Nicotine, tar, HCN, volatile aldehydes, and nitrosamines are some of the identified hazardous substances in tobacco smoke. Out of 7000 chemicals, around 70 chemicals are proven carcinogens in the tobacco smoke.

BURDEN OF DISEASE

The total number of tobacco users in the World has been estimated at 1.2 billion, which is expected to rise to 1.6 billion during 2020s. There are 100 million deaths that occurred due to smoking in 20th century. With the same trend there will be 1 billion deaths in 21st century. At present, tobacco use causes death of 3.5 to 4 million people globally every year, which is expected to increase to about 10 million during 2020s and 80% of these cases will be in developing countries.

Tobacco is used for smoking as well as in smokeless form in India (Bhonsle 1992). Smoking of tobacco is mainly in the form of bidi, followed by cigarette, hukah, chilum, chutta, etc. The habit of smokeless tobacco (also referred as tobacco chewing) is also very common. Some common forms of smokeless tobacco include khaini, Mainpuri tobacco, mawa, masherior, mishri, etc. Mishri is prepared by roasted tobacco leaves principal constituent being alkaloid nicotine in 1 to 7%. The roasted tobacco leaves are powdered and homemade but also available in market under different names.

Nationwide surveys have been carried out in India for prevalence of tobacco use (Gupta 1996, Chaudhary 2002, NSSO 1998, 1991) covering rural as well as urban areas revealed that 23.2% to 69.3% males and 4.0% to 50% females consumed tobacco in any form. Based on reports of second national level survey in 1996, 184 million persons (150 million males and 34 million females) in India used tobacco (Government of India 2001). In 61st National Sample Survey it was found that per capita consumption of bidi smoking has gone down by 31% both in rural and urban areas and cigarettes smoking gone down by 30% in rural areas but very little in urban areas.

According to NFHS III (2005-06) any kind of tobacco use in 15-49 years was 57% in males, 10.8% in females; cigarette and biddis smoking was 32.7% in

Table 23.1: Disease categories with increased risk of smokers

Respiratory System Chronic bronchitis, pneumonia, emphysema, influenza, tuberculosis, asthma, chronic rhinitis ***Cancer:*** Lung, paranasal sinuses, nasopharynx, larynx,	**Circulatory System** Angina, Ischemic Heart disease, Myocardial infarction, aortic aneurism, atherosclerosis, cerebrovascular disease, peripheral vascular diseases	**Sensory & Nervous System** Hearing loss, optic neuropathy, Ocular histoplasmosis, tobacco amblyopia, mascular degeration, Nystagmus, Posterior subcapsular cataract, parkinson's disease, depression
Digestive system Acute necrotizing Ulcerative gingivitis, tooth loss, stomach ulcer, Crohn's disease, ***Cancer:*** Oral cavity-lip tongue, oropharynx, esophagus, pancreas, stomach, liver,	**Skeletal system** Neck pain, back pain, rheumatoid arthritis, osteoarthritis, osteoporosis,	**Muscular System How** Muscle injuries, tendon injuries, ligament injuries
Reproductive System Sexual impotence, sperm count reduction, fertility decreases, ***Cancer:*** Urinary tract, bladder, uterus, renal pelvis, uterine, cervix, endometrium	**Endocrine-Digestive, Hemopoietic System** Diabetes Type 2, Non insulin dependent, graves' disease, decrease immune system, ***Cancer:*** Myeloid leukemia	**Skin** Psoriasis, skin wrinkling

males and 1.45% in females. However, in Assam tobacco use was as high as 72.4% in males and 23.2% in females and cigarette/biddi smoking is 36% in males and 0.6% in females.

As per Global Adult Tobacco Survey-India (2010), there are 274.9 million (smoker-68.9 million, smokeless user-163.7 million, dual form user-42.3million) adult tobacco users in India. An estimated one million people die every year due to tobacco related diseases in India. The prevalence of overall tobacco use among adults is 35% (male-48%, female-20%). Considering the use of smoking products among males and females, prevalence of cigarette is higher in urban areas where as prevalence of other smoking tobacco products are higher in rural areas. Similarly prevalence of each of the smokeless tobacco product is higher in rural than urban areas except Gutkha, which is equally prevalent in rural and urban areas.

The prevalence of tobacco use in industrial workers and labourers is much higher. In one study it was found that 85.9% of the loom workers were using tobacco and they spent around Rs. 8.63±4.58 daily (Ansari ZA, et al 2010).

On the other hand 234 million people are using smokeless tobacco in Southeast Asia region. With smokeless tobacco smokers percentage is ranging from 5%-50% from Himachal Pradesh to Bihar. On average in India 32.9% and 18.4% adults are using smokeless tobacco. In 13-15 Years age group 11.1% males and 6% females are using smokeless tobacco in India (GAT Survey WHO 2009). Pan chewing has gone up by 18% in rural and 28% in urban areas. This also indicates that increasing price of cigarettes has made impact on rural people than urban. Overall consumption of tobacco has not gone down because chewing pan has gone up in both rural and urban areas. Chewing tobacco

Table 23.2: Project Global Tobacco related deaths in 2015

	Number (Millions)	Percent of Total
All causes	6.43	100
Tuberculosis	0.09	1
Lower respiratory infections	0.15	2
Malignant neoplasms	2.12	33
Trachea, bronchus, lung cancers	1.18	18
Mouth and oropharynx cancers	0.18	3
Oesophagus cancer	0.17	3
Stomach cancer	0.12	2
Liver cancer	0.10	2
Other malignant neoplasms	0.34	5
Diabetes mellitus	0.13	2
Cardiovascular diseases	1.86	29
Ischaemic heart disease	0.93	14
Cerebrovascular disease	0.52	8
Other cardiovascular diseases	0.24	4
Respiratory diseases	1.87	29
COPD	1.76	27

Mathers & Loncar 2006 PLoS

eight to ten times a day is equivalent to 30-40 cigarettes per day as far as amount of nicotine intake is concerned, so chewing even less frequently than smoking could lead to nicotine dependence and hence is a dangerous behavior. Various studies have estimated the prevalence of the use of Mishri ranges from 17 to 45% (Gupta 2006, Khare 1993, Pratinidhi et al 2010).

In one study it is found that there were 4.7% early neonatal deaths in the Mishri users as compared to 1.7% in the non-users (Pritinidhi et al 2010) and the birth weight was 100-450g lesser in users (Pratinidhi 1995). In Global Tobacco Survey 2010 Adult, Khaini is 11.6%, Gutkha is 8.2% and Betel nuts use is 6.2% prevalent. Lowest prevalence is in Himachal Pradesh and highest in Bihar. It is also noticed that 4-6% quit and 30-40% (34%) wanted to quit the tobacco use. But advise to quit from health professionals is not encouraging. Only 50% of smokers and 25% of smokeless persons were advised to quit by health professional according to the survey. Also GATS-India (2010) survey revealed similar low trend in quit advising by health professionals.

Among these tobacco users, there are a section of daily users with high nicotine dependence, no history of quit attempt and no intention to quit. These tobacco users are known as hardcore users who respond less to the tobacco cessation intervention. In India, there are 24.3 million hardcore smokers (Kishore 2013) and 39.5 million hardcore smokeless users (Jena 2012a) comprising of around 1/4th of daily users of respective tobacco products.

Second hand smoking (SHS): As per Global Adult Tobacco Survey India 2010, 52% of the adults are exposed to second hand smoke at home; 30% are exposed to SHS at work place, and 17.5% are exposed in public transport. SHS is known human carcinogens according to International Agency for Research on Cancer (IARC). There are at least 7000 toxic chemicals in SHS of which about 70 are carcinogenic. Children exposed to SHS are at an increased risk of sudden infant death syndrome, acute respiratory infections, ear infection, bronchitis, and severe asthma. In adult it causes cardiovascular, and lung cancer also.

It was estimated in 1986 that at least 630,000 persons died (Gupta 1988) and in 1996, about 800,000 persons died due to their tobacco habit (ICMR 1996). It has been found that smokers perform badly during surgery and after operation risks of complications are more.

Economic burden of tobacco

India is the second largest producer of tobacco in the world. It is second largest country in consumption of unmanufactured tobacco as well (USDA 2004). Tobacco provides on an average 10% of India's total excise revenue, of which 88% is contributed by cigarettes. The returns to the farmers from tobacco cultivation are high, but the cost of production is also high and thus, the relative return from the crop may not be highest for tobacco. Tobacco economics should be studied in relation to it being a "demerit good". The short-run, indirect macroeconomic, secondary benefits of tobacco use are easily outweighed by the conservatively estimated costs of three major diseases associated with the use of tobacco, as shown by an ICMR study. The report underlined the public health angle as critical to an approach towards tobacco use, while not ignoring the short run, secondary and indirect benefits to economy other than tobacco consumers who bear the brunt of the addiction (Gupta 1988). The report said that information on costs due to tobacco related cancers, coronary artery disease and chronic obstructive lung diseases, are available through a study of the Indian Council of Medical Research. The average cost due to a case of tobacco related cancers (Rath 1999) for the year 1990-91 was Rs. 134,449. The average cost of a case of chronic artery disease (NSSO 1998) for 1992 was Rs. 14,909, whereas the average cost of a case of chronic obstructive lung disease was Rs. 11,952. Using the same discounting rate as used in ICMR study, the average cost of tobacco related cancers, coronary artery disease, and chronic obstructive lung disease, for the year 1999 was estimated to be Rs. 350,000, Rs. 29,000, and Rs. 23,300.

The total cost to the country for the year 1999 due to these three disease entities was estimated at Rs. 27,761 crore (Rath 2002). The cost in 2002-2003 was estimated to have risen to Rs. 308.33 billion, an increment of 11% in two years (NCMH 2005). In recent report of the Health Ministry, it is estimated that US $ 285 million are used in treating smokeless tobacco cancers and diseases.

If the current use of tobacco among adults is reduced to half by the year 2020, 180 million deaths due to tobacco could be avoided. Tobacco cessation is the only way to save the current tobacco users from tobacco related mortality and morbidity in the short run.For the younger population who have not started tobacco health promotion activities are needed.

Ministry has recommended that a Comprehensive Anti-Tobacco Program should be implemented as part of the National Cancer Control Program. Strategies are:

1. Education of the public,
2. Practice of Tobacco Control, and
3. Advocacy of Tobacco Control.

Major efforts for tobacco control in India

1. *Warning on cigarette packages/ advertisements:* According to the Cigarette (Regulation of Production, Supply and Distribution) Act 1975 all packages and advertisements of cigarettes must carry a statutory warning, "Cigarette smoking is injurious to health". The Parliament's Committee in December 1995 observed that these warnings are not followed (Lok Sabha Secretariat 1995) and suggested that there should be strong & mandatory warning in regional languages on tobacco products; ban on direct as well as indirect advertisement of tobacco products; prohibition of smoking in public places; initiation of measures for awareness on tobacco through health infrastructure, educational institutions and mass media; and initiation of efforts for persuasion of farmers to switch over to alternate crops.
2. *Warning on smokeless tobacco products:* According to the Food Adulteration Rules (1954) every package and advertisement of smokeless tobacco product should have a warning stating that "chewing of tobacco is injurious to health". Packages of areca nut should also state that "chewing of supari may be injurious to health".
3. *Cabinet guidelines for smoking in public places:* Cabinet secretariat by an administrative order in 1990, prohibited smoking in certain places such as hospitals, dispensaries, educational institutions, conference rooms, domestic air flights, A/C sleeper coaches in trains, suburban trains, A/C buses, etc. State Governments were also advised to discourage sale of tobacco products in and around educational and health related institutions.
4. *Comprehensive legislation on tobacco control:* Legislation has also been promulgated by the states of Delhi, Kerala, Goa and Rajasthan, aimed mainly on prohibition of smoking in public places. Recently, many states such as Tamil Nadu, Maharashtra, Andhra Pradesh, etc., have imposed a ban on production and sale of *gutka* and *pan masala*-containing tobacco, as a short-term measure.
5. *Multi-sectoral approach for tobacco control:* The problem of tobacco in India is complex, in view of the varied nature of its use; association of a large number of sectors like health, agriculture, finance, mass media, labor, education, industry, welfare, etc.; dependence of a large number of people on tobacco production & processing; and need for action by many agencies. The situation necessitates multisectoral approach, however the progress is very slow.
6. *Community education on tobacco:* Antitobacco Interventions are beneficial (Gupta et al 1992). No Tobacco Day (31st May) celebration is also helpful in creating awareness among people. Tobacco has been included as a topic in books brought about by NCERT. National Cancer Control Program also stresses on antitobacco education. The Indian Council of medical research (ICMR 2000) carried out operational research studies on antitobacco community education through involvement of existing infrastructures (ICMR). The studies involved radio, health infrastructure, schools and community volunteers.
7. *Expert committee on health hazards of pan masala containing tobacco:* The Directorate General of Health Services constituted committee realized that pan-masala and other chewable tobacco products are causative factors for oral cancer. Various state Governments have banned the sale and production of such products as a short-term measure, till a long-term strategy for dealing with this substance is finalized.

Tobacco Control Cell

A Tobacco Control Cell has been established in the Department of Health since August 2000, under

Deputy Secretary (PH), with the aim of coordination of activities related to tobacco control, with the help of a 7 member Advisory Board. The current activities initiated through this cell include, educational programs through mass media and schools, strategy papers for alternate crops and bidi workers, advocacy workshops for non-health sectors, and establishment of tobacco cessation clinics.

COMMENTS

Antitobacco Program

Investment on antitobacco is cost effective. It has been estimated that US $1 investment on antitobacco would save US$13. Anti-Tobacco Campaign should includes:

1. *Professional Action:* professionals should set example and educate patient and public wherever they come in contact with. They must learn to treat or refer a case of tobacco dependence. Teachers should also be role model for the students and should also make an effort to inculcate the antitobacco feeling in students.
2. *Public Action:* This should be through mass movement so that more people participation can be generated. People should be told about the smoke free environment particularly smoke free home because of following reasons (Jiloha 2005):
   - Smoke free home is safe for women and children;
   - Smoke free home smells much better;
   - In a smoke free home food tastes better;
   - In a smoke free home curtains and cloths do not stain badly;
   - Visitors feel good in a smoke free home;
3. *Government Action:* includes the financing of health education program, more stringent warning on package of cigarette ("Smoking is injurious to Health") or printing of photograph of a cancer patient, ban on sales promotion, heavy taxation, reduction of the land for tobacco production and encouraging manufacturers and distributors to accept more safer productions and distribution.
4. After reviewing the impact of tobacco on human and environmental health it is realized that there should be a separate program on Anti-Tobacco.
5. In the program special emphasis should be given to household environmental tobacco smoke because children and women are the victim of passive smoke and they suffer in silence (Jiloha 2005).
6. Behavior change communication: There is a wide spread belief that topical use of tobacco improves oral hygiene, prevents dental caries, and because the tobacco is not swallowed there are no adverse systemic side-effects. There is social acceptance of use of smokeless and smoking tobacco. Health promotion module could be effective tool to help smokers to quit (Neelima 2009).
7. *Monitoring of Tobacco Use:* Government of India is partnership with CDC, USA and WHO is conducting Global Adult Tobacco Survey to monitor tobacco use and to evaluate its anti tobacco policy/interventions. However credibility of GATS has been questioned many times (Jena 2012b, Jena 2013) owing to poor definition of indicators, inadequate piloting, invalid responses in the collected data and non adjustment of confounders before estimation. Though GATS data was entered directly in a handheld device by the data collectors, simple validation of data collecting interface could have improved data quality. Government should review GATS-India survey for generating valid and reliable estimations for monitoring of tobacco use.

Framework Convention on Tobacco Control (FCTC)

This initiative by the World Health Organization provides countries a platform to sit together and discuss the issue and agree or disagree on a certain set of tobacco control measures for adoption.

TOBACCO FREE INITIATIVES

WHO established the Tobacco Free Initiatives (TFI) in 1998. Long term mission of TFI of WHO is to reduce prevalence of smoking and tobacco consumption in all countries and among all groups, and thereby reduce the burden of disease caused by tobacco. The Goals of the TFI are:

1. Galvanize global support for evidence based tobacco control policies and actions;
2. Build new partnerships for action and strengthen existing ones;
3. Heighten awareness of the need to address tobacco issues at all levels of society;
4. Accelerate the implementation of national, regional and global strategies;

5. Commission policy research to support rapid, sustained and innovative actions; and
6. Mobilize resources to support required action.

WHO has introduced the MPOWER measures to help the countries to implement and manage their national tobacco control program in a more practical manner. It corresponds to one or more articles of the WHO FCTC. The six components of MPWOER strategy are:

1. Monitor tobacco use and prevention policies
2. Protect people from tobacco smoke
3. Offer help to quit tobacco use
4. Warn about the dangers of tobacco
5. Enforce bans on tobacco advertising, promotion and sponsorship
6. Raise taxes on tobacco

WHO has developed partnership with UNICEF, World Bank, CDC, Environment Protection Agency, US National Institute of Health, International NGOs, Private Sector, and Academic Centers for tobacco prevention work. In 53rd and 54th World Health Assembly all member states reaffirmed for the actions required to control tobacco.

Role of e-Cigs in cancer causation

Tobacco smoke contains around 70 cancer causing substances. For this reason electronic cigarettes were designed as healthy alternative for smokers. But recent study showed that nicotine is linked with breast cancer. WHO has warned against e-cigs use saying there is no evidence that e-cigs are safe contrary to the claims of manufactures. An e-cigs user's inhalation or the press of a button activates the heater to atomise the liquid from the cartridge. Vapor is produced and LED lights up. Device mimics the sensation of puffing a normal cigarette minus the tobacco, carbon monoxide, tar and ash (Yuan-soon et al 2010, Journal of National Cancer Institute). The report concludes that the use of refillable electronic e-cigarettes, and the potential exposure to e-liquids containing nicotine, may pose risks to public health. There are four main risks related to the use of refillable e-cigarettes: (1) poisoning from ingesting e-liquids containing nicotine (especially for young children); (2) skin reactions related to dermal contact with e-liquids containing nicotine and other skin irritants; (3) risks associated with home blending; and (4) risks due to using untested combinations of e-liquid and device or hardware customisation.

References

Ansari ZA, et al. Prevalence of tobacco use among power loom workers- a cross sectional study. Indian J Comm Medicine 2010; 35 (1): 34-39.

Bhonsle RB, et al. Tobacco habits in India. In: Gupta PC, & Hamner JE III (eds.), Control of tobacco related cancers and other diseases. International Symposium, 1990. Oxford University Press, Bombay, 1992; p 25-46.

Central Health Education Bureau. World No Tobacco Day 2001: Smoking kills: Lets clear the Air. The Hindustan Times. May 31st 2001.

Chaudhry K, et al. Prevalence of tobacco use in Karnataka and Uttar Pradesh. Final report of the study by the Indian Council of Medical Research and WHO, SEARO. 2002.

Doll R, et al. Mortality in relation to smoking: 40 years' observations on male British doctors. BMJ, 1994; 309: 901-11.

Govt of India. Report of Expert Committee on economics of tobacco use in India. Ministry of Health & Family Welfare, Government of India, February 2001.

Govt of India. Global Adult Tobacco Survey 2009-10. International Institute for Population Studies (IIPS), Ministry of Health & Family Welfare, Government of India, 2010.

Gupta PC (1988). Health consequences of tobacco use in India. World smoking and health, Spring 1988; 5-10.

Gupta PC et al. Int J Epi 2005; 34: 1395-402.

Gupta PC. Smokeless tobacco use and risk of stillbirth. A cohort in mumbai, India. Epidemiology 2006; 17: 47-51.

Gupta PC. Survey of sociodemographic characteristics of tobacco use among 99,598 individuals in Bombay, India, using hand held computers. Tobacco control, Summer 1996; 5(2): 114-20.

Gupta PC, Mehta FS, Pindborg JJ, Bhonsle RB, Murti PR and Aghi AB. A 10-year follow-up study for primary prevention of oral cancer among Indian villagers. In: Gupta PC, Hamner JE II and Murti PR (eds). Control of tobacco-related cancers and other diseases. Oxford University Press, Bombay, 1992; p 307-13.

Gupta PC. Tobacco Noncommunicable Diseases. Ind J Pub Health 2004; 48 (3): 105-110.

ICMR. Tobacco Plain Facts (1996). Division of Noncommunicable diseases, Indian Council of Medical Research, New Delhi, India, 1996.

Jena PK et al. Extending application of the 'hardcore' definition to smokeless tobacco use: estimates from a nationally representative population in India and its implications. Asian Pac J Cancer Prev 2012a; 13:5959-63.

Jena PK et al. Prevalence and patterns of tobacco use in Asia. Lancet 2012b; 380:1906. (Correspondence)

Jena PK et al. Global Adult Tobacco Survey: A case for change in definition, analysis and interpretation of "Cigarette" and "Cigarettes per Day" in completed and future surveys. Asian Pacific J Cancer Prev 2013; 14: 3299-04.

Jiloha RC. Women and Children: Victims of Passive Smoke (Personal Communication) 2005.

Khare R. Use of Mishri in day to day life of an urban community of Managalwar Peth. Pune. PRESM. J Comm Health 1993; 18: 77-82.

Kishore J et al. Hardcore Smoking in Three South-East Asian Countries: Results from the Global Adult Tobacco Survey. Asian Pacific J Cancer Prev 2013; 14: 625-30.

Lok Sabha Secretariat. Committee on Subordinate Legislation (10th Loksabha) Rules/ regulations framed under The Cigarette (Regulation and Production, Supply and Distribution) Act, 1975. Lok Sabha of India, December 1995.

Mathers CD, Loncar D. Projections of global mortality and burden of disease from 2002 to 2030. PLoS Med 3(1): e442.doi: 10. 1371/journal.pmed.0030442.

NSSO (1991). Sarvekshana, Journal of the National Sample Survey Organization, Department of Statistics, Ministry of Planning, Government of India, July-September 1991; XV(1): p 375 & 406.

NSSO (1998). Sarvekshana, Journal of the National Sample Survey Organization, Department of Statistics, Ministry of Planning, Government of India, January-March 1998; p 76.

Pritinidhi AK, et al. relationship of use of mishri during pregnancy and weight of the newborn. J Obset Gynecol India 1995; 1:72-7.

Pritinidhi AK, Use of Mishri a smokeless form of tobacco during pregnancy and its perinatal outcome. Ind J Comm Medicine 2010; 35 (1): 14-18.

Rath G.K. and Chaudhry K. Estimation of cost of tobacco related cancers – Report of an ICMR task force study (1990-96). Indian Council of Medical Research, New Delhi, 1999.

Rath GK and Chaudhry K. Cost of tobacco related diseases. Paper presented during the WHO international conference on 211 global tobacco control law: towards a WHO framework convention on tobacco control, at New Delhi, India, 7-9 January 2002.

Rath GK and Chaudhry K. Estimation of cost of tobacco related cancers. Report of an ICMR task force study (1990-1996). Indian Council of Medical Research, New Delhi, 1999.

Royal College of Physicians. Smoking and health. London: Pitman Medical Publishing, 1962. 209.

United Nations. World Population Projects. In 2002 revision population database <http://esa.un.org/unpp/>

US Department of Health and Human Services. Smoking and health. Report of the advisory committee to the Surgeon General. Washington DC: US Government Printing Office (PHS publication no 1103), 1964.

US Department of Health and Human Services. The health consequences of smoking: 25 years of progress. A report of the Surgeon General. US Department of Health and Human Services, Public Health Service, Center for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1989; DHHS Publ No. (CDC) 89-8411, 1989.

Wiebel FJ. Health effects of passive smoking. In: Bolliger CT, & Fagerström KO (eds.) (1997). The tobacco epidemic. Progress in respiratory research Vol 28, Karger, Basel, 1997; p 107-21.

World Health Assembly 53rd and 54th May 20th 2000.

CHAPTER 24

NATIONAL ORAL HEALTH PROGRAM

INTRODUCATION

Oral cavity plays an important role for our body system. Not keeping oral hygiene may lead to infections which can transmit to any of the organ associated with oral cavity, for example ear, nose, eyes, salivary glands, tonsils, larynx, respiratory tract, and gastrointestinal tract. Teeth are vital for mastication of food that helps in proper digestion. Following structures are present in oral cavity where bacteria can grow and produce infection: i) tooth surface, ii) inter-dental spaces, iii) gingival pocket, iv) labial and lingual vestibules, v) saliva, vi) fold of tonsils, vii) cheek, viii) tongue, ix) hard and soft palate.

After taking meal the particles of food remain in inter-dental spaces and allow the bacteria present on the oral cavity to grow. The rate of growth is much faster in night than in day that is why it is always necessary to clean the teeth in the night after meal. These bacteria may produce decalcification of tooth (caries), infection of gum (gingivitis), stomatitis, etc.

Dental caries is defined as the destruction of the tooth resulting from a series of complex biomedical events occurring at a localized site on the enamel, dentin or cementum. This decay causes very bad effect on oral and general health of the children particularly in 5-9 years age group followed by 10-14 years. The prevalence of dental caries ranges from 18.43% to 51.1% in children and in 57.47% in population aged 2-40 years (Shrivastava et al 2005; Vecher 1952; Dutta 1965; Chakraborty 1997;). Dental caries is associated with fluoride content of drinking water which is less than 0.5 mg/L. The periodontium consists of investing and supporting of teeth i.e. gingivae (gums), periodontal ligaments, cementum and alveolar bone. It is widely affected by dental plaque-a diverse microbial community found on tooth surface embedded in matrix of polymers of bacterial and salivary origin. Later other supporting structures become involved so that small pus filled pockets from around teeth. There is loss of attachment and bone loss leading to tooth motility. In northern India prevalence of some forms of periodontal disease range from 40% to 86.6% (Singh et al 2005; Venkatesh 1987). In south it is reported to be as high as 95%. In Poona slum prevalence of calculus was found to 95.8%. 62.2% of patients had gingivitis and 34.3% showed advanced periodontal involvement (Singh 1982). 35% of total teeth extracted after the age of 35 years are due to periodontal diseases (Kulkarni 1995). The disease process was enhanced under the effect of tobacco use (Sood 2005). Prevalence of oral diseases is very high in India with dental caries (50%, 52.5%, 61.4%, 79.2%, and 84.7% in 5, 12, 15, 35-44, and 65-74 year old, respectively) and periodontal diseases (55.4%, 89.2%, and 79.4% in 12, 35-44, and 65-74 years old, respectively) as the 2 most common oral diseases (Bali et al 2004).

Oral diseases such as dental caries, periodontal diseases, malocclusion and oral cancers constitute an important public health problem in India today. Almost

85% of the children and 95-100% of adult population is suffering from periodontal diseases, which is initially painless, chronic, self destructive leading to gradual loss of tooth. 35% of all body cancers are oral cancers. About 30-35% of children suffer from mal-aligned teeth and jaws affecting proper function.

Current research indicates that:

- About 18% of pre-term low birth weight deliveries are due to periodontal disease in pregnant mothers.
- Patients with periodontal disease are at 2-4 times greater risk for heart attacks regardless of tobacco use.
- Diabetes patients having periodontitis have 3.2 times increased risk of cardio-renal mortality.
- Periodontitis is also likely to increase the risk of many other diseases like chronic obstructive pulmonary disease, coronary artery disease, atherosclerosis, MI, stroke, osteoporosis, etc.
- Periodontal patients are more likely to develop stress related disorders due to altered cortisol levels.

Treatment of dental disease is very expensive and time consuming. For a rough estimate, for children below 14 years the restorative treatment of dental caries having average decayed tooth to be 2, it would require about Rs. 5200 crores excluding the salary and infrastructure. The loss of working hours due to dental illness is also huge. Oral diseases can restrict activities at school and at work place and can have significant psychological impact, affecting the quality of life.

Periodontal disease is one of such chronic disease for which evidence is available for effective prevention (Rozier 1998; Ishikara et al 1995). Prevention can be achieved by effective and regular removal of calculus by trained personnel. Adverse personal habits like smoking, tobacco chewing, overeating, etc. should be discontinued. Health education and health promotion are indispensable in achieving this target.

At present there are about 35,000 registered dentists serving the entire population of 100 crore with majority of them living in the urban areas. It can be stated that there is a great paucity of dental professionals in the country. However, increase in number of professionals through rapidly growing dental colleges must be regulated for its quality and should focus on the need of general population. Rural areas, where need of dental health is more, should be given priority.

PROGRAM

A comprehensive oral health care project on a pilot basis was launched by the Directorate General of Health Services, Govt. of India in July 1999 for three years in one district each of five States, namely Himachal Pradesh, Haryana, Punjab, Delhi and Rajasthan. At present, there is no National Oral Health Program under implementation. However, a pilot project on oral health was initiated in 1999 and All India Institute of Medical Sciences, New Delhi is the nodal agency for development of the project. School dental health program was run and 6000 schools across 72 cities and 16 states covered. Training modules were developed for dental surgeons, health workers and school teachers. The project was reviewed by National Institute for Health and Family Welfare in 2004.

Components

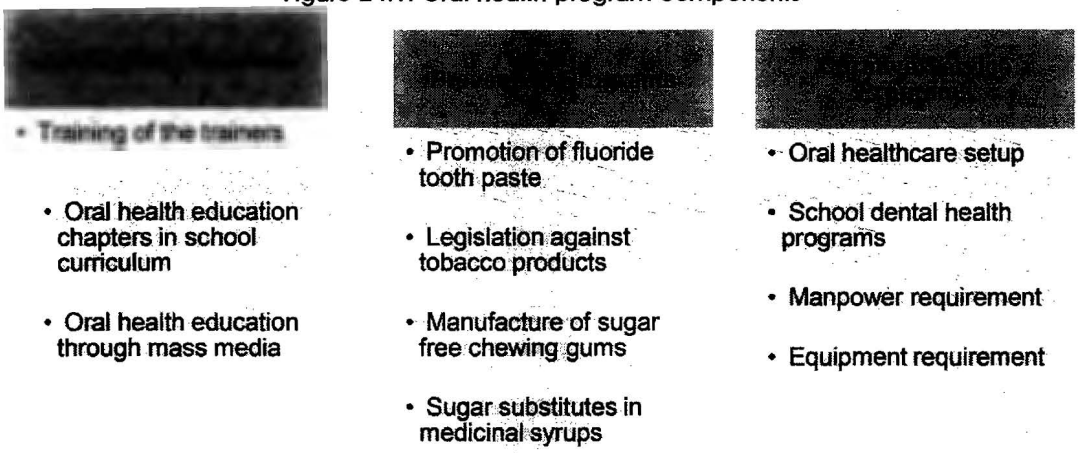
National oral health program must have compoents as given in figure 24.1.

A. *Oral Health Education:* Multipurpose workers (MPW) should be trained to impart oral health education who will provide pain relief and be able to refer the case for further investigation and treatment. Oral health education materials like charts, posters, pamphlets, models and comics should be developed to be used in community and schools. To spread the message of oral health to the masses, all the three media of communication, i.e. audiovisual, print and folk media should be utilized to the maximum. The number of other health workers such as family planning workers, social health workers, anganwadi workers, and number of voluntary organizations such as Rotary Club, Lion's Club are operating and active in urban areas and can be utilized for the delivery of oral health education. Networking with other allied departments such as education, youth affairs and sports, and social welfare should also be utilized.

B. *Formulation of basic package on oral health:* Atraumatic Restorative Treatment can be performed even where electricity is not available. Such package are useful and should be locally developed.

C. *Manpower and infrastructure requirement for primary and secondary prevention of oral diseases:* Administrative set-up at the national, state and district levels need to be strengthened for planning, implementation, monitoring and evaluation of oral and dental health programs in the state. Definite norms need to be laid down for establishment of dental care

Figure 24.1: Oral health program components


• Training of the trainers
• Oral health education chapters in school curriculum
• Oral health education through mass media
• Promotion of fluoride tooth paste
• Legislation against tobacco products
• Manufacture of sugar free chewing gums
• Sugar substitutes in medicinal syrups
• Oral healthcare setup
• School dental health programs
• Manpower requirement
• Equipment requirement

Source: Kothia NR, et. al. Int J Health Policy Manag. 2015

facilities at different levels in terms of manpower, space, equipments, instruments and consumables.

Mobile dental clinics to provide on-the-spot diagnostic, preventive, interceptive and curative services to the people and school children in far-flung rural areas of the state should be made available. There should be at least 3-4 mobile dental vans at each district level catering to a population of 4.5 to 5 lakh. Each mobile van should have two dental chairs, units, each with airturbine, micro-motor, ultrasonic scalers and other equipments. There should be three dental surgeons, one dental hygienist and three chair-side assistants posted with mobile units.

Strengthening school health services is very effective in reducing the prevalence of oral diseases. Good habits and healthy lifestyle behavior learned early in life, would help reduce the disease burden in later life. Children also carry the health messages learned in school to their homes and spread the knowledge to their parents, grandparents and siblings. At least one dental surgeon per district should be appointed for school dental health program exclusively to perform the following: oral health education, regular dental checkups, demonstration of correct brushing technique, supervised fluoride mouth rinsing, fluoride varnish application, fissure sealants, Atraumatic Restorative Therapy (ART) and provide primary treatment measures where needed.

Each state under the DHS (dental) must identify one or more training centers in the state for Continuous Dental Education. With emerging infections and threat from blood borne transmissible diseases, it is very important for dentists and other dental professionals to have safe dental practices guidelines.

Private Sector Involvement

Colgate-Palmolive India continues its march in the area of spreading oral health awareness through the School Dental Health Education Program. Under this program, over 4 million school children in rural and urban parts of the country in the age group of 6-12 years have been reached. Members of various Indian Dental Association (IDA) local branches organized the program across the country with the help of audiovisual aids, posters, charts and demonstration of right brushing techniques, lectures, teacher training programs and the organization of dental health weeks and checkup camps. The message of good oral care is additionally reinforced through the distribution of attractively designed and user friendly education materials.

Comments

1. Educating all people living in remote and rural areas with "facts of oral health" remained a challenge even today.
2. Production of eligible dental healthcare planners with necessary training is one of the challenges for expanding oral healthcare. lack of dentists in the government decision-making bodies, inability to generate manpower of good quality according to the changing needs of the society. Lack of awareness in dental graduates in their responsibilities towards the society, underutilization of internship program by dental

colleges, lack of resources to the fastest growing population, overlooking of geriatric population. Programs must not just address apparent behavioral factors of oral health problems.

3. Absence of surveillance of oral healthcare services which is helpful to direct planners;

4. Expensive oral treatment limits the people to seek appropriate treatment which further endanger oral health;

References

Bali RK, Mathur VB, Talwar PP, Chanana HB. National Oral Health Survey & Fluoride Mapping, 2002-2003, India. Delhi: Dental Council of India; 2004.

Chakraborty M, Saha JB, Bhattacharya RN, Roy A, Ram R. Epidemiological correlates of dental caries in urban slum of West Bengal. Indi J Pub Health 1997; 41(2): 56-60.

Dutta A. Study on prevalence of periodontal and dental caries amongst school going children. J Ind Dental Assoc 1965; 37: 12-16.

Govt. of India. Ministry of Health & Family Welfare: Major Schemes and Program 2000.

Ishkiwa A, Kimura T, Tomozane T. Effect of Repeated tooth brushing instructions on periodontal health in community. Nippon-Koshu-Eisa-Zasshi 1995; 42(9): 777-782.

Kothia NR, et al. Assessment of the Status of National Oral Health Policy in India. Int J Health Policy Manag. 2015 Sep; 4(9): 575–581.

Kulkarini AT, Sachdeva NI. The problems of oral health in India. Swasth India 1995; May-June 62-64.

Rozer RG. Dental public health. In Wallace RB et al. Public Health and Preventive Medicine. Washington: Prentice Hall International Inc 1998: 1091-1112.

Singh GPI. An epidemiological study of periodontal diseases in a semi urban community. MD Preventive and Social Medicine Thesis. University of Poona 1982.

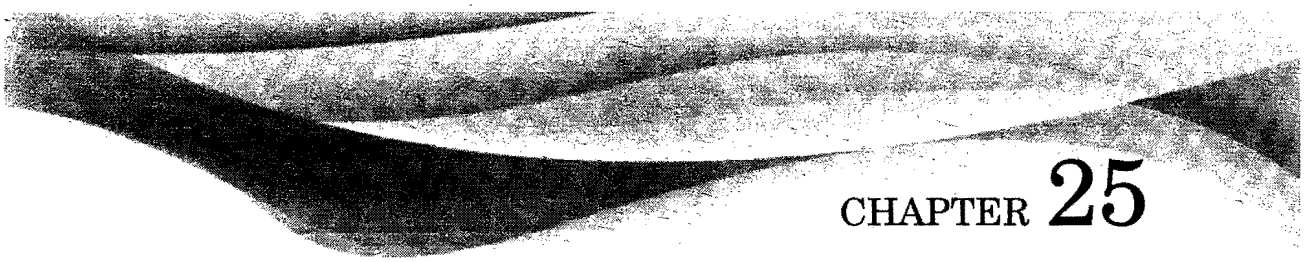
Singh GPI, Bindra J, Soni RK, Sood M. Prevalence of Periodontal diseases in urban and rural areas of Ludhiana, Punjab. Ind J Com Med 2005; 30: 128-129.

Shrivastava P, Sadhukahan SK, Bhattacharya RN, et al. A study of dental caries among primary school students in Naxalbari village, Darjeeling, West Bengal. Journal of Medical Science 2005; 19 (1): 2-5.

Sood M. A study of epidemiological factors influencing periodontal diseases in selected areas of district Ludhiana, Punjab. Ind J Comm Med 2005; 30 (2): 70-71.

Vecher BR. Dental Survey of school children in Amritsar. J India Dental Assoc 1952; 24: 2-4.

Venkatesh S. Oral Health in India-Current status and strategy. For health education Swasth Hind 1987: 304-307.



CHAPTER 25

NATIONAL ORGAN TRANSPLANT PROGRAM

INTRODUCTION

The estimated number of new patients who reach end-organ failure in every year and died is as follows:

- Kidneys 100,000
- Liver 80,000
- Heart 80,000
- Lung Several thousand
- Pancreas >50,000
- Cornea 10,00,000

Treatment available at present for these end organ problems is:

- Dialysis facilities available only at select centers.
- Kidney transplant to approximately 3500 per year. Most of the kidney transplantations are from live donors.
- Few thousand corneas are transplanted every year.
- Only few transplantations of liver (<150), heart (<40), lung (2), pancreas (2) done in the past 10 years.

Similarly there are paucity of skilled manpower and facilities in the country for transplantation. There are less than 100 kidney transplantation centers, less than 350 nephrologists involved in transplantation and less than 10 transplantation surgeons.

Although there is Transplant of Human Organ Act 1994 and rules 1995 applicable to whole of India, but services are not improving at the pace required for the quality health care delivery.

ACTIVITIES

1. Preventive

- For every patient who reaches end stage organ failure, there are ten who are in various stage of failure. Education, promotion of preventive measures, cross liasioning with various other programs such as Non-Communicable Disease control, etc. for following activities: healthy lifestyle habits and early detection management and follow-up.

2. Health Education

- Health education of the general public about healthy lifestyle for prevention of chronic diseases;
- Promoting awareness among professional of various disciplines as well as students at medical college level of the growing importance of prevention, timely recognition and treatment of various kinds of organ failure.
- Change in attitude of the general public about organ donation from the dead cadavers or brain stem dead patients for retrieval of organs. Existing religious beliefs prevent the near relatives from donating organs from dead patients. Results from cornea donations have also not been very encouraging.

3. Curative

- Encouragement for opening up of more centers for various kinds of transplantation.
- Dialysis: there should at least 2 machines at every

district hospital with a nephrologist in the phased manner. There are approximately 600 districts, i.e., approximately 1200 dialysis machines are required. Indigenous machines are likely to cost approximately Rs. 1 to 1.5 lakh.

- Transplantation at every medical college and other suitable hospitals, in a phased manner.
- Coordination of pharmaceutical companies in making available the latest drugs required for organ failure and transplantation including immunosuppressants, in an expanding market, at lowered costs.

4. Surveillance and Research

- Collection of data regarding incidence, treatment, results, follow-up, efficacy of therapy.
- Analysis and publication of data.
- Pure research, especially in genetics/stem-cell/ nanotechnology/biomedical engineering, etc.

5. Training

- Number of transplant professionals is decreasing, while the number of patients is increasing.
- CME should be made available for practical and structured training at all levels.

6. Enhanced role of Organ Retrieval Banking Organization

There is a need of formation of Nodal center for transplantation activity that should be located at the state level. All altruistic donors intending to donate organs after deaths should be registered. Similarly potential recipients for cadavers transplants should also be registered. At the district level district organ transplant program should be run through district societies in collaboration with NGOs.

Initiatives

Union Health Ministry is setting up the autonomous National Organ Procurement and Distribution Organization (NOPDO) at the Centre and 10 State Organ Procurement and Distribution Organization (SOPDO) under the country`s new National Organ Transplant Programme (NOTP), Delhi, Mumbai, Chennai, West Bengal, Hyderabad, Ahmedabad, Chandigarh, Thiruvanthapuram, Lucknow and Bangalore have been identified as locations for SOPDO.

NOPDO will strive to increase on the availability of organs from cadaver donors, build capacity for retrieval of organs and transplantation and roll out post-transplant services to both recipients and living donors.

The ministry has also planed to start a Indian Organ Donor Register, enabling individuals to record their legal consent to become an organ or tissue donor after death. This registry will have information on all types of organ procurement, matching, distribution, transplantation and complications. It will also maintain entries of transplant centres, transplant surgeons, dialysis physician and dialysis centres. There are many incentives devised such as giving recognition certificate, Free annual health check up to living donor and free treatment of all donor-related complications would be promoted.

There is need of enhancing facilities for organ transplantation throughout India, establish network for equitable distribution of retrieved deceased organs, increase organ availability through change in attitude and facilitating the retrieval of deceased organs, building up human resource like training required manpower.

The ministry also plans to build 10 new facilities for kidney and two for liver transplantation both in public and private sector. The ministry is also increasing networking of the transplant centers for organ sharing. There are about 200 kidney, 30 liver and 14 heart transplant centres across India.

Reference

Planning Commission. Eleventh Five Year Plan. Government of India.

Zeenews. Govt to set up national body for organ transplan. Wednesday, January 25, 2012

CHAPTER 26

NATIONAL PROGRAM FOR HEALTH CARE OF ELDERLY

INTRODUCTION

Aging is an inevitable phenomenon. The life expectancy of humans since the 19th century has drastically gone up leading to a large number of older persons. People about the age of 60 years are considered to be in the geriatric group. Over the years the number of elderly in the developing countries is rapidly increasing and will soon surpass the number in the developed countries.

CHANGES IN THE SOCIAL STRUCTURE

Older people are often isolated, living on the margins of families and communities and deeply vulnerable. The extent to which they are reached by services and support depends upon the development of the community. The brunt of social implications of migration from rural to urban areas is borne by the elderly. The moving into the city by a single person, often a man is followed by his wife and children living behind the elderly. These older persons left in the rural areas are largely landless labourers surviving on day to day earning, without any long term savings.

The older people moving with their children into the urban areas also face problems. There is lack of space due to inadequate housing facilities, loneliness and isolation.

Older people who have been staying in the urban areas are mostly staying alone when their children move out to other cities or countries due to work demands. The majority of the old people continue to work into very old age, often despite chronic and disabling illness.

CHANGING ATTITUDES TOWARDS THE OLD

Older individuals often played highly valued roles. In the olden times in the joint family the decision of the head of the family, who was often the oldest member was the rule of law. Elderly were a source of wisdom and their advise was sought on all important matters like marriage, property and other financial decisions which were required to be taken. Women did not enjoy the same status as the men. Over the years, the respect and care of the elderly is continuing decreasing. The older populations are excluded from decision making, access to services and support and are even at times neglected or abused.

On the other hand the dependence on the elderly for contribution towards rearing of grand children and contribution towards house keeping is increasing.

GENDER AND AGING

An aging woman could be an asset or a liability depending upon our perspective. Women out live men in nearly all the countries of the world. Hence the proportion of widows increases with age. These women are more likely to be dependent upon social support, more susceptible to depression and psychological problems due to their isolation and reduces status. On the other hand, the older women tend to bear the burden of responsibility of subsistence farming, house hold work with diminished resources.

Attitudes toward the Old

Strands of veneration for and antagonism toward the aged coexisted in all early modern societies. The extreme views represented by these strands were in constant dialectical tension, underpinning the complex set of social relations that characterized individual older people's relationships within their communities.

Attitudes toward old women varied. The image of the wise old woman and the nurturing elderly mother or grandmother played a role in literature, but representations of older women, especially widows, were more often negative, or even vicious. Images in cheap print stereotyped old women as witches, and literature frequently represented old women as lascivious fools, querulous gossips, or shrill scolds. While recent studies have deepened our understanding of the image of the witch as an old woman, the image of the witch as an old age demonstrates the ways misogyny and antagonism toward the aged could interact in this period.

Assistance to the Aged

Because of inability to do industrial work in old age they are having vulnerable economic situations and moving down in economic status. Older individuals generally tried to remain self-supporting, and there were expectations of familial aid, but the elderly poor often depended on public assistance. In most European countries, poor relief was not regulated, but individual communities provided assistance for some of their elderly members. Forms of poor relief varied by country, region, and city, but community assistance usually took one of three forms: statutory poor relief, institutions like hospitals and asylums, and charity.

History of assistance to the aged

England's "Old Poor Law" serves as the good example of statutory poor relief. Under the Elizabethan Poor Acts of 1601, unpaid church wardens and overseers in each of the country's parishes collected poor-relief taxes and redistributed the money to the poor residents of the parish. The statute specifically called for "necessary relief" to be given to the aged and decrepit poor. Historians differ in their assessment of the scope, generosity, and regional variation of the Old Poor Law's provision for the elderly, but it is certain that this system generated assistance ranging from occasional handouts to subsistence-level pensions for a significant minority of the aged population in many parishes in early modern England. The nature of the assistance changed as poor relief grew more extensive throughout the country.

In Protestant Germany, large hospitals– charitable institutions set up to serve the aged, young, poor, needy, prostitutes, and so forth– such as those in Hesse, which were founded after the Reformation as a means to replace monastic charity, specifically served infirm people over sixty. If an old person's petition for entrance into the hospital was accepted, he or she could depend on the hospital to provide a bed and subsistence for the remainder of his or her life. Similarly, both the Hospital of Saint Sixtus and the Apostolic Hospital in Catholic Rome privileged the elderly poor as particularly deserving of assistance. Indeed, the early modern period witnessed a growing acceptance of the institutionalization of the elderly in the last stage of life. All of these sources of assistance– formal poor relief, local institutions, and charity– helped the elderly who fell into need maintain themselves.

Household and Family

As they aged, individuals sought to stay closely connected to their children and/or to more extended networks of kin. These relationships were structured around reciprocal obligations and notions of familial bonds and duties as well as around ties of real affection and attachment in many cases. Spouses, especially, gave vital support to one another, and children's duty to support their aged parents was but one strand of the thickly woven thread that bound together the elderly and their families. Resources within families often flowed downward from the aged to the younger generations; in early modern sources, the efforts of the old for their families surface repeatedly and importantly. Most of Western Europe followed a model of nuclear family households, but that older people were fairly often reincorporated into these households, especially after the death of an old parent's spouse. Older people shared a fundamental desire to stay closely attached to their families and friends as they strove to retain their economic self-sufficiency. They also shared, in the broadest terms, a culture that offered many different paths through the aging process, so that individuals were not narrowly restricted to norms of "acting one's age."

India

The traditional norms and values of the Indian society laid stress on showing respect and providing care for the aged. However, in recent times, society is changing due to rapid urbanization, globalization and international migration, which resulted withering of the joint family system. A large number of parents are being neglected by their family members exposing them to lack of emotional, physical and financial support. There is no adequate social security. This clearly reveals that ageing has become a major social challenge and there is a need to provide for the economic and health needs of the elderly and to create a social milieu, which is conducive and sensitive to emotional needs of the elderly.

Aged Population

Person who is more than 60 year is considered as old. 60-65 year is young old, 66-75 year is old old, more than 75 is oldest and more than 100 is cenetarian. It is estimated that there are currently more than 600 million people aged sixty and above all over the world. An even more marked increase is expected in the number of the oldest-old (persons aged 80 years and over) whose number is expected to rise from 86 million in 2005 to 394 million in 2050.

India, as the second most populous country has 76.6 million people at or over the age of sixty (2001 Census) constituting about 7.7% of its total population. This number of older persons was 19.8 million in 1951. The projected numbers of 60+ in India will increase to 100 million in 2013 and to 198 million in 2030.

People more than 60 years is 8% of the total population which would be 19.1% in 2050. The life expectancy, which was around 29 years in 1947 and 59 years in the 1970s has increased to 68 years for female and 64 for male at birth and at 60 years it is 16 for males and 18 for females.

The problems faced by this segment of the population are numerous, owing to the ongoing social and cultural changes, and the inherent vulnerability of the elderly to diseases. Approximately 40% of them live below poverty line and another 30% live just above subsistence level. Perception about deprivation of finances, companions, security and low mood among elderly is common (Lena et al 2009).

Disease Burden

Major causes of morbidity among elderly according to ICMR (1980) are as follows:

Diseases	*Percentage*
Visual impairment	88.0
Locomotor disabilities	40.0
Neurological diseases	18.7
Cardiovascular diseases	17.4
Respiratory diseases	16.1
Skin diseases	13.3

The recent trend is little different because hypertension (39.53%-59.1%), cataract (35.3%), arthritis (33.67%-41.3%), COPD (19.92%), CHD (18.85%), Benign Hypertrophy of prostate (16.23%), Diabetes Mellitus (10.3%-15.23%), Dyspepsia (11.03%), Irritable bowl syndrome (9.2%) and depression (8.5%) are among top 10 morbid conditions among elderly (Sharma 2003, Lena 2009). In an ICMR study it was found that 8.5% of elderly with the age of 60 years had psychiatric illness. About 6% of the geriatric population had meet the criteria of depression. In studies carried out other settings such as urban slums it was found around 45% (Jain & Aras 2007).

Beside medical problems that causes dependency on others there are other problems such as:

- Physical problems making self maintenance of health difficult;
- Economic inadequacy due to loss of employment;
- Social isolation, loneliness, unwantedness, change in social contacts due to retirement, loss of spouse, etc.
- Feeling helplessness, increasing intergenerational distances due to medical illnesses and advancement of technology and social norms.

NATIONAL POLICY FOR OLDER PERSON

The government has formulated the policy for older person with the objectives of providing health and social insurance, and enabling and supporting voluntary and nongovernmental organizations (Please Refer the Policies Section).

FIVE YEAR PLANS

The health of the elderly requires comprehensive care with preventive, curative and rehabilitative services.

Unlike the developed nations, India does not have a well structured Geriatric Health Services, thus leading to a relatively ad hoc system of health care delivery for the elderly.

The National Policy on Older persons (1999) has emphasized the major issues relevant to the elderly population and the need to provide specialized geriatric services at various levels of health care. The program is expected to result in a healthy elderly community with better physical and mental health and independence (For more details please see the Policy section).

Mission

A community based holistic care system, which offers every citizen above the age of 60 years the opportunity to participate in a health care program, which includes preventive, curative and emergency health care services of high quality.

Goal

To improve the access to promotive, preventive, curative and emergency health care among elderly persons.

Objectives

- Provide comprehensive health care to the elderly by preventive, curative and rehabilitative services.
- Train health professionals in geriatrics, including supportive care and rehabilitation.
- Develop scientific solutions to specific elderly health problems by research into geriatrics and gerontology.

Strategies

Level 1: A home based health service, which will comprise of a visiting component intended as an early warning system to detect health problems, and as a source of psychological support.

Level 2: A community based health center for the elderly providing a base for educational and preventive activity and an out patient medical service. This would be the base for the home health services, and for the program in general.

Level 3: An improved hospital-based support service with focused health care needs, at the institute.

NATIONAL PROGRAM FOR HEALTHCARE OF ELDERLY

The National Program for the Health Care for the Elderly (NPHCE) is an articulation of the International and national commitments of the Government as envisaged under the UN Convention on the Rights of Persons with Disabilities **(UNCRPD),** National Policy on Older Persons **(NPOP)** adopted by the Government of India in 1999 & Section 20 of "The Maintenance and Welfare of Parents and Senior Citizens Act, 2007" dealing with provisions for medical care of Senior Citizen.

Vision

- To provide accessible, affordable, and high-quality long-term, comprehensive and
- dedicated care services to an Ageing population;
- Creating a new "architecture" for Ageing;
- To build a framework to create an enabling environment for "***a Society for all Ages***";
- To promote the concept of *Active and Healthy Ageing*;
- Convergence with National Rural Health Mission, AYUSH and other line departments like Ministry of Social Justice and Empowerment.

Specific Objectives

- To provide an easy access to promotional, preventive, curative and rehabilitative services to the elderly through community based primary health care approach
- To identify health problems in the elderly and provide appropriate health interventions in the community with a strong referral backup support.
- To build capacity of the medical and paramedical professionals as well as the care takers within the family for providing health care to the elderly.
- To provide referral services to the elderly patients through district hospitals, regional medical institutions

Core Strategies

- Community based primary health care approach including domiciliary visits by trained health care workers.
- Dedicated services at PHC/CHC level including provision of machinery, equipment, training, additional human resources (CHC), IEC, etc.

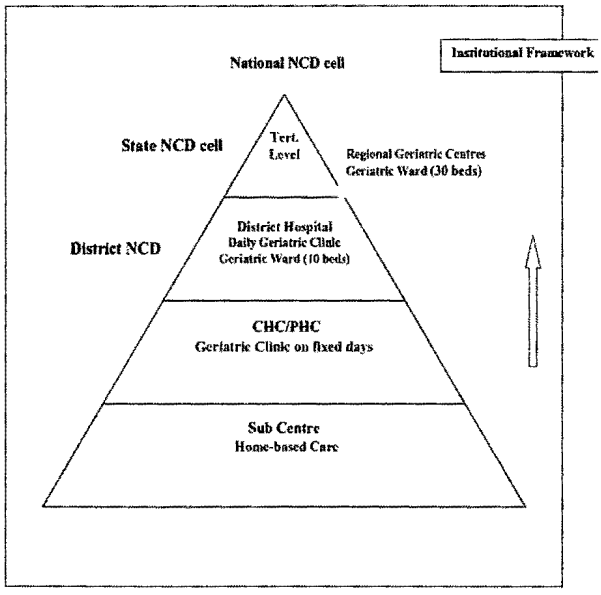
- Dedicated facilities at District Hospital with 10 bedded wards, additional human resources, machinery & equipment, consumables & drugs, training and IEC.
- Strengthening of 8 Regional Medical Institutes to provide dedicated tertiary level medical facilities for the Elderly, introducing PG courses in Geriatric Medicine, and in-service training of health personnel at all levels.
- Information, Education & Communication (IEC) using mass media, folk media and other communication channels to reach out to the target community.
- Continuous monitoring and independent evaluation

Supplementary Strategies

- Promotion of public private partnerships in Geriatric Health Care.
- Mainstreaming AYUSH – revitalizing local health traditions, and convergence with programmes of Ministry of Social Justice and Empowerment in the field of geriatrics.
- Reorienting medical education to support geriatric issues.

Expected Outcomes of NPHCE

- Regional Geriatric Centres (RGC) in 8 Regional Medical Institutions by setting up Regional Geriatric Centres with a dedicated Geriatric OPD and 30-bedded Geriatric ward for management of specific diseases of the elderly, training of health personnel in geriatric health care and conducting research;



- Post-graduates in Geriatric Medicine (16) from the 8 regional medical institutions; Video Conferencing Units in the 8 Regional Medical Institutions to be utilized for capacity building and mentoring;
- District Geriatric Units with dedicated Geriatric OPD and 10-bedded Geriatric ward in 80-100 District Hospitals;
- Geriatric Clinics/Rehabilitation units set up for domiciliary visits in Community/Primary Health Centres in the selected districts;
- Sub-centres provided with equipment for community outreach services;
- Training of Human Resources in the Public Health Care System in Geriatric Care.

Packages of services to be made available at different levels under NPHCE

Health Facility	Packages of services
Sub-centre	• Health Education related to healthy ageing • Domiciliary visits for attention and care to home bound / bedridden elderly persons and provide training to the family care providers in looking after the disabled elderly persons. • Arrange for suitable callipers and supportive devices from the PHC to the elderly disabled persons to make them ambulatory. • Linkage with other support groups and day care centres etc. operational in the area
Primary Health Centre	• Weekly geriatric clinic run by a trained Medical Officer • Maintain record of the Elderly using standard format during their first visit • Conducting a routine health assessment of the elderly persons based on simple clinical examination relating to eye, BP, blood sugar, etc. • Provision of medicines and proper advice on chronic ailments • Public awareness on promotional, preventive and rehabilitative aspects of geriatrics during health and village sanitation day/camps. • Referral for diseases needing further investigation and treatment, to Community Health Centre or the District Hospital as per need.
Community Health Centre	• First Referral Unit (FRU) for the Elderly from PHCs and below. • Geriatric Clinic for the elderly persons twice a week. • Rehabilitation Unit for physiotherapy and counselling • Domiciliary visits by the rehabilitation worker for bed ridden elderly and counselling of the family members on their home-based care. • Health promotion and Prevention • Referral of difficult cases to District Hospital/higher health care facility
District Hospital	• Geriatric Clinic for regular dedicated OPD services to the Elderly. • Facilities for laboratory investigations for diagnosis and provision of medicines for geriatric medical and health problems • Ten-bedded Geriatric Ward for in-patient care of the Elderly • Existing specialities like General Medicine; Orthopaedics, Ophthalmology; ENT services etc. will provide services needed by elderly patients. • Provide services for the elderly patients referred by the CHCs/PHCs etc • Conducting camps for Geriatric Services in PHCs/CHCs and other sites • Referral services for severe cases to tertiary level hospitals
Regional Geriatric Centre	• Geriatric Clinic (Specialized OPD for the Elderly) • 30-bedded Geriatric Ward for in-patient care and dedicated beds for the elderly patients in the various specialties viz. Surgery, Orthopedics, Psychiatry, Urology, Ophthalmology, Neurology etc. • Laboratory investigation required for elderly with a special sample collection centre in the OPD block. • Tertiary health care to the cases referred from medical colleges, district hospitals and below

Institutional framework for the implementation of NPHCE

Program Structure-Integration with NRHM:
Financial management group (FMG) of Programme Management support units at state and district level, which is established under NRHM, will be responsible for financial management

State Health Society (SHS):
Under the NRHM framework different Societies of national programmes such as Reproductive and Child Health Programme, Malaria, TB, Leprosy, National Blindness Control Programme have been merged into a common State Health Society is chaired by Chief Secretary/Development Commissioner. Principal/ Secretary (Health & Family Welfare) is the vice chair person and mission director is the Member -Secretary of the State Health Society

District Health Society (DHS)
At the district level all programme societies have been merged into the District Health Society (DHS).

Management structure
The NCD Cell constituted at the central level for planning, monitoring and implementation of the National Program for Prevention and Control of Cancer, Diabetes, CVD and Stroke (NPCDCS) will also be responsible for PPHCE.

INTEGRATED PROGRAM FOR OLDER PERSONS

Assistance under the scheme is given to the Government/ Non-Governmental Organizations/ Panchayati Raj Institutions/ local bodies for the following purposes:

(i) Programs catering to the basic needs of Older Persons particularly food, shelter and health care to the destitute elderly;
(ii) Programs to build and strengthen intergenerational relationships particularly between children/youth and Older Persons;
(iii) Programs for encouraging Active and Productive Ageing;
(iv) Programs for proving Institutional as well as Non Institutional Care/Services to Older Persons;
(v) Research, Advocacy and Awareness building programs in the field of Ageing; and
(vi) Any other programs in the best interests of Older Persons.

Programs under the Scheme

(i) **Maintenance of Old Age homes** to provide food, care and shelter for a minimum number of 25 destitute older persons.
(ii) Maintenance of Respite Care Homes and Continuous Care Homes for a minimum of 25 Older Persons who live in old age homes but are seriously ill requiring continuous nursing care and respite.
(iii) Running of Multi Service Centres for Older Persons to provide daycare, educational and entertainment opportunities, healthcare, companionship to a minimum number of 50 older persons.
(iv) Maintenance of Mobile Medicare Units to provide medical care to the older persons living in rural and isolated and backward areas.
(v) Running of Day Care Centers for Alzheimer's Disease/Dementia Patients to provide specialized day-care to the Alzheimer's disease patients.
(vi) Physiotherapy clinics for older persons
(vii) Disability and hearing aids for older persons
(viii) Mental health care and Specialized care for the Older Persons to provide Mental Health Care Intervention Programs to the elderly. This scheme is also open to organizations/ hospitals, which are already into mental health care. The scheme would help such organizations to integrate the component for older persons, which is hitherto neglected.
(ix) Help-lines and Counseling Centers for older persons
(x) Sensitizing programs for children particularly in Schools and Colleges
(xi) Regional Resource and Training Centres
(xii) Training of Caregivers to the older persons
(xiii) Awareness Generation Programs for Older Persons and Care Givers like Self-care, preventive health care, disease management, preparation for old age/healthy and productive ageing; intergenerational bonding.
(xiv) Multi facility care centres for destitute older widow women to provide shelter, educational, occupational and entertainment opportunities, healthcare, companionship to the widowed older women. Widow and destitute gets cash benefits of Rs. 10000 on time assistance by cheque.

(xv) **Volunteers Bureau for older persons**

(xvi) **Formation of Vridha Sanghas/Senior Citizen Associations.**

(xvii) **Indra Gandhi Old age pension Scheme:** Central government has started this scheme to give pension of Rs. 200 to all those are above age of 60. This amount is different from state to state as individual state add the extra amount with central allocation according to their own scheme.

Delhi and Goa governments are providing old age assistance of Rs. 1000 per month whereas Maharashtra (Rs. 500), Puducherry (Rs. 600), Utrakhand (Rs. 400), Jharkhand (Rs. 400), Himachal Pradesh (Rs. 330), Uttar Pradesh (Rs. 300) provide different amount. Rajasthan give Rs. 500 upto the age of 75 years and above this age it is Rs.750 (Hindustan 10th August 2010).

(xviii) **Any other activity, which is considered suitable to meet the objective of the scheme.**

The Government of India can provide up to 90% of the cost of the project indicated in the scheme and the remaining can be borne by the organization/ institution concerned.

In the case of schools, colleges, Educational Institutions and recognized youth organizations such as Nehru Yuvak Kendra Sanghathan (NYKS) and the National Service Scheme (NSS) undertaking programs and services for Older Persons, up to 100% cost of the project indicated in the scheme shall be provided by the Government.

Reference

Government of India National Policy for Older Persons 1999. Ministry of Social Justice and Empowerment, GOI, New Delhi.

Govt. of India. Integrated Program for Older Person. Ministry of Social Justice and Empowerment, Government of India 2008.

Government of India. The Constitution of India.

Gray, Louise. "The Experience of Old Age in the Narratives of the Rural Poor in Early Modern Germany." In *Power and Poverty: Old Age in the Pre-Industrial Past,* edited by Susannah

Jain RK, Aras RY. Depression in Geriatric Population in Urban Slums of Mumbai. I J Public Health 2007; 51 (2): 112-113.

Kertzer, David, and Peter Laslett, eds. *Aging in the Past: Demography, Society, and Old Age.* Berkeley, 1995. Kertzer's conclusion has a good discussion of nuclear reincorporation.

Lena A, et al. Health and social problems of elderly: A cross-sectional study in Udupi Taluk, Karnataka 2009; 34: 131-134.

Ottaway, Lynn Botelho, and Katharine Kittredge, pp. 107–124. Westport, Conn., 2002.

Pelling, M., and R. M. Smith, eds. *Life, Death, and the Elderly: Historical Perspectives.* London, 1991. A classic work and an excellent bibliographical reference tool.

Planning Commission. 11th Five Year Plan (Draft). Govt. of India (http://www.planningcommission.nic.in)

Rowlands, Alison. "Witchcraft and Old Women in Early Modern Germany." *Past and Present* 173, no. 4 (2001): 50–89.

Thane, Pat. *Old Age in English History: Past Experiences, Present Issues.* Oxford, 2000.

Sharma AL. "Geriatrics" a challenge for the twenty first century. Ind J Public Health 2003; 47 (3): 16-20.

Venkoba Rao A. National Task force study on problems of the aged seeking psychiatric help. ICMR 1987. Mental Health status of the elderly. ICMR Bulletin 1996; 26:5.

CHAPTER 27

NATIONAL PROGRAM FOR PREVENTION AND CONTROL OF DEAFNESS

Over 5% of the world's population – 360 million people – has disabling hearing loss (328 million adults and 32 million children). Disabling hearing loss refers to hearing loss greater than 40 decibels (dB) in the better hearing ear in adults and a hearing loss greater than 30 dB in the better hearing ear in children. The majority of people with disabling hearing loss live in low- and middle-income countries (WHO). Hearing loss is the second leading cause for 'Years lived with Disability (YLD)' the first being depression. As per WHO estimates in India, there are approximately 63 million people (6.3%) who are suffering from significant auditory impairment. There are 291 persons per one lakh population who are suffering from severe to profound hearing loss (NSSO 2001). The estimates burden of disease in the school going age group in India is about 26.4 million. Such large number of hearing impaired young Indians lead to severe loss of productivity both physical and economic. However data is deficit on milder form of hearing loss but it would be even larger. Noise is the insidious of all industrial pollutants, involving every industry and causing severe hearing loss in every country in the world. Some 1.1 billion teenagers and young adults are at risk of hearing loss due to the unsafe use of personal audio devices, including smartphones, and exposure to damaging levels of sound at noisy entertainment venues such as nightclubs, bars and sporting events Occupational hearing loss includes acoustic traumatic injury and noise induced hearing loss, and can be defined as a partial or complete hearing loss in one or both ears as the result of one's employment. Worldwide, 16% of the disabling hearing loss in adults is attributed to occupational noise, ranging from 7 to 21% in the various sub-regions (Nelson et al 2005). Noise induced hearing loss is the second most common form of acquired hearing loss after age-related loss (Presbycusis) (Nandi et al 2008). Over 60% of the causes of hearing impairment are preventable, and can be corrected surgically and can be rehabilitated with the use of hearing aids, speech and hearing therapy.

Causes of hearing loss

- Aging process
- Occupational hazard (those who are working in noisy areas)
- Wax in the ear
- Chronic ear infection
- Diseases of tympanum
- A hole in tympanic membrane
- Growths and masses in the ear and bones and cancer like diseases

Objectives

Long term: To prevent and control major causes of hearing impairment and deafness, so as to reduce the total disease burden by 25% of the existing burden by the end of 12th Five Year Plan (MOHFW).

Immediate

- prevent the avoidable hearing loss on account of disease or injury.
- Early identification, diagnosis, and treatment of ear problems responsible for hearing loss and deafness.
- To medically rehabilitate persons of all age groups, suffering with deafness.
- To strengthen the existing inter-sectoral linkages for continuity of the rehabilitation program, for persons with deafness.
- To develop institutional capacity for ear care services by providing support for equipment, material and training personnel.

Strategies: In the 12th Five Year Plan, it is proposed to implement the Programme in 200 new districts in addition to the existing 192 districts in a phased manner with the following components:

a. Prevention through Behaviour Change Communication (BCC) Majority of causes of deafness may be prevented by raising awareness among the health care providers and the community. For such awareness generation, various categories of mass media, community education and interpersonal communication approaches will be used.

b. Capacity building which will include:

1. Training: Seven types of training are proposed for various categories of health professional at different levels of health care facilities including training/sensitization of ENT doctors, Audiologists, Obstetricians and Paediatricians, Medical officers, MPWs, PHNs, AWWS, Anganwadi workers and their supervisors, teachers, ASHA and parents of disabled children.

2. Manpower support: Ear care services shall be strengthened by providing ENT Surgeon, Audiologist, Audiometric Assistant and Instructor for hearing impaired in each district on contractual basis.

3. Equipments: To strengthen the early detection and management of hearing impaired, health care facilities will be provided financial support to procure the equipments.

4. Rehabilitation and Hearing Aid provision: The hearing aids will be issued under ADIP Scheme implemented by Ministry of Social Justice & Empowerment as per criteria developed for implementation of the programme (ADIP).

5. Screening for Hearing Impairment: The activity of screening of all the School Children of the district to ascertain the magnitude of Hearing Impairment among the School Children and Screening in the Urban Slums shall be conducted in Public Private Partnership (PPP) mode.

6. Referral services: Effective linkages would be developed from peripheral level to district level with the help of functionaries and personnel from grass root level to the District level officers.

c. Monitoring and Supervision is being done closely at Central and State level.

d. Public Private Partnership

e. Operational Research & Evaluation

There is no hearing aid for Hearing Impaired children. However the Ministry of Social Justice will be involved for provision of Hearing Aids under their ADIP scheme and Screening Camps would be organized in convergence with the Rashtriya Bal Swasth Karyakram (MOHFW Annual Report).

Organizational Structure

Central: Central Coordination Committee will be constituted at the central level. This will consist of the following members: Representative of DGHS 2; Representative of WHO 1; ENT specialists and experts 2; Audiologists and speech therapists 2; Public Health Experts 1; Representative of Rehabilitation Council of India (RCI) 1. This committee will evaluate and monitor the implementation plan for program. Central cell will be set up at the central level in the DGHS to provide necessary leadership, technical support. The Programme is a 100% Centrally Sponsored Scheme. Various Programme activities are implemented at Central, State and District level.

State: State Health Society and Program Committee should be placed under NRHM. It will function for: the preparation of District plans for implementation of National Program for prevention and control of deafness; Monitoring and supervise implementation of program; Release and monitoring of flow of funds to the district health societies; and review and take appropriate measures for the expenditure. State technical committee will have two ENT specialist and 1 audiologist to provide technical guidance and expertise to the state health society.

District: At the district level the District Health Society and Program Committee will function for planning, implementation of the program, monitoring of program, financial and material management, social mobilization and public awareness, orientation of various functionaries of health and other related sectors, procurement of equipments and other materials, arrangement for screening camps and monitoring the activities of NGOs. District Hospital will post one ENT surgeon and the Audiologist for the implementation of the program. They can also employ additional staff: Program assistant who is qualified with 1 year diploma in audiology/audiometric and a teacher for young hearing impaired.

Program implementation

- The state medical college would be the center of excellence that will support the program. The district hospital is to be the main focus of activity for the program. It would be strengthened through training of ENT doctors and audiologist alongwith the provision of equipment to enable diagnostic, therapeutic and rehabilitation activities.
- The doctors at PHC and CHC will also be given training as well as the basic diagnostic equipments, to enable them to diagnose, treat and refer the patients requiring further treatment with ear diseases and hearing problems.
- The multipurpose workers male and female at the subcenter level and the gross level functionaries (AWWs, ASHA), including Panchayati Raj Institutions community based organizations such as Mahila Mandals will be sensitized about the program which would facilitate in creating awareness and mobilizing the communities.
- The school health system will play a very important role in the program as approximately 20% of the population is in the age group 5 to 14 years and children suffer from chronic supportive Otitis media, serous otitis media and ear wax. The school teachers of the primary section would conduct a survey with the help of questionnaire for the primary children. The ear checkups will be done by the school health doctors/PHC or CHC doctors.

Program activities

- Training of all the manpower
- Infrastructure building
- Screening, early diagnosis and management
- Provision of surgical and rehabilitative services as well as hearing aid provision.
- IEC activities

Audiometry BERA (Brainstem Evoked Response Audiometry) is automated, simple and reliable screening test but cost is prohibiting factor to make it available in all the places. Another test is Behavioral observation audiometry (BOA) assess the baby's response to different frequency intensity and duration of sounds presented. The newborn baby responds to 70 db noise by eye blink, eye widening or startle, and between 6 weeks and 16 weeks by arousal, eye blink or eye shift can be useful to detect to indicate hearing impairment in early life.

PROGRAMME COMPONENTS

1.MANPOWER TRAINING & DEVELOPMENT

Objectives:

1. To orient all the Health Care personnel from the district to grassroot level about prevention, promotion, early identification and rehabilitation of all types of ear diseases leading to deafness.
2. To make these personnel aware of the existing facilities available for deafness in order to facilitate appropriate referral.
3. To sensitize the health care personnel regarding their specific roles in the programme.
4. To enable the health providers to provide a leadership role in creating awareness about hearing impairment.
5. To facilitate development of suitable manpower, in order to be able to implement this programme in the entire nation, in a phased manner.

2. Ear Screening Camps

- Screening camps will be organized in collaboration with NRHM for screening the general population in respect of ear problems, hearing impairment and deafness.
- Spreading awareness regarding ear problems, early detection of deafness, available treatment and health care facilities for referral of such cases.
- Education of community, especially the parents of young children regarding importance of right feeding practices, various common ear problems,

early detection of deafness in young children and available treatment for hearing impairment/ deafness.

- Education of Panchayat members, members of Mahila Mandals and Youth leaders.

1. Treatment
2. Referral services:
3. Rehabilitation and Hearing Aid provision:
4. Awareness Creation among Parents/ community (MOHFW Operational guidelines)

Achievement

Modules for training of doctors, multipurpose workers and technicians have been developed. In some places such as Delhi training of trainers has been started. In many districts hearing aids are distributed to poor children. The GOI Programme Division has taken up and included 4 districts of Delhi in National Programme for Prevention and Control of Deafness (NPPCD Prog). The "State Health Society Delhi" is implementing NPPCD programme in Delhi on district pattern through respective "Integrated District Health Society". This program is integrated with the NRHM framework (DGHS).

COMMENTS

Once again loading of information about deafness and burden of detection and mobilization of deafness on ASHA and anganwadi worker indicates poor planning. These part time workers can not be the pillar of health system who are neither the permanent health staff nor skilled enough to handle. Once agains a series of training program will start for all levels of health professsionals without identifying the impact factors of previous trainings on other subjects. But since its inception, after few training program nothing moved. In 12th Five year plan not much emphasis is given on this program. Similarly in NRHM also it is low priority.

References

DGHS. Annual report 2014-15. DGHS. Govt. of NCT Delhi. [Cited 2016 June 3]. Available at: http://delhi.gov.in/wps/wcm/connect/83ade8804c7e241581 dead9843b21e62/REPORT+ANNUAL+14-15++ 11042016+new.pdf ?MOD=AJPERES &lmod=1017305563& CACHEID=83ade8804c 7e241581 dead9843b21e62&lmod= 1017305563& CACHEID = 83ade8804c7e241581 dead9843b21e62

MOHFW. Annual report 2013-14. MOHFW. [Cited 2016 June 3]. Available at: http://nrhm.gov.in/images/pdf/media/publication/Annual_Report-Mohfw.pdf

MOHFW. National programme for prevention and control of deafness. Operational guidelines for the 12th Five Year Plan. NPPCD, MOHFW, Govt. of India. [Cited 2016 June 3]. Available at:http://www.mohfw.nic.in/ WriteReadData/ l892s/ 5189275161902525838 3Operational %20Guidlines %20for%2012th%20 Plan.pdf

Nandi SS, Dhatrak SV. Occupational Noise Induced hearing loss in India. IJOEH 2008; 12 (2): 53-58.

Nelson DI, et al The global burden of occupational noise induced hearing loss. Am J Ind Med 2005; 48: 446-58.

Planning Commission. 11th Five Year Plan, Govt. of India.

Govt. of India. Modules for Training of Medical professionals. Ministry of Health and Family Welfare, New Delhi.

WHO. Deafness and hearing loss- fact sheet N*300. Geneva. WHO. [Cited 201 June 3]. Available at: http://www.who.int/mediacentre/factsheets/fs300/en/

CHAPTER 28

ESSENTIAL MEDICINES AND PROGRAM OF RATIONAL USE OF DRUGS

Worldwide more than 50% of all medicines are prescribed, dispensed, or sold inappropriately, while 50% of patients fail to take them correctly. Moreover, one-third of the world's population lacks access to essential medicine (WHO). the Drug Control General of india stated that about 54,000 cases of adverse drug reaction (ADR) were reported during the past 18 months. They have involving about 100 medical colleges across the country to create awareness about ADR.

Interpol carried out a global sting operation on the multi-billion dollar spurious medicine trade, which led to seizure of 9.8 million doses of illegal medicines, shutdown of about 9,600 fake online pharmacies and scores of arrests (indiamedicaltimes.com). Such illegal activities are potentially dangerous for public health and need to be controlled.

Essential medicines are those that satisfy the priority health care needs of the population. They are selected with due regard to public health relevance, evidence on efficacy and safety, and comparative cost-effectiveness. They should be available all the times, in adequate amount, in the appropriate dosage forms, with assured quality an adequate information and at a price the individual and the community can afford. The WHO has developed the first essential medicines list in 1977 and revised every 2 years. The non-availability of required medicines jeopardizes the credibility of the public health system. The expenditure pattern on medicines of the state government shows that there are wide ranging differences across states in India, from as little as less than 2% in Punjab to as much as 17% in Kerala during 2001-02. The Central government's share of medicine in its total health budget is around 12%. In all, roughly 10% of the health budget goes into procuring medicine in India (Sakthivel S. 2005). This is pertinent to develop standard treatment guidelines and Delhi is the first state to launch a program of rational use of drugs in the state along the lines recommended by the WHO Program of Rational Use of Drugs.

The Rational Use of Medicines (RUM) is defined as patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community (WHO 2004). There is 3 M concept in Rational Use of Medicines: Medicines, Mean and Money. Thus, RUM means less profit and income for those dealing with medicines, prescribers, and sellers. To handle these issues there is a need of policy and guidelines to frame standard treatment guidelines and implimentation of these guidelines.

Drug Policy Statement

In 1994 the state of Delhi issued a Drug Policy Statement of the government to attain the following:

1. Availability of safe and effective drugs at all hospitals and health centers,
2. Establishment of a good quality control and assurance system,
3. An improved system for pooled procurement, storage, and distribution of drugs,
4. Prescribing of drugs by generic names,
5. Strengthening the health education programs regarding the use of drugs, and
6. Research on all aspects of drug use.

Implementation

The Drug policy statement also listed following steps, which are be taken to implement the drug policy:

1. Selection of one common list of essential drugs for all hospitals in state,
2. Pooled procurement of drugs for all hospitals in the state by a method which would help in obtaining only good quality drugs,
3. Preparation of a State Formulary,
4. Setting up a system of inspection of pharmaceutical houses of good manufacturing practices,
5. Setting up a system of testing drugs for quality at selected laboratories,
6. Setting up a training program for doctors in rational prescribing,
7. Providing objective, up-to-date information about drugs to doctors and other health personnel,
8. Preparation of standard treatment schedules for those drugs being used at the PHC,
9. Ensuring that ethical criteria for drug promotion and advertising are observed, and
10. Providing information to the patients about the medicines they are being asked to take.

A pre-implementation visit to all hospitals was made to assess the situation. List of drugs was prepared by a committee. This committee constitutes clinicians, pharmacologists, microbiologists, Drug controller of India, Drugs controller and Director of Health Services, and experts. This process has been identified as a dynamic process that needs constant updating, revisions, and research.

Procurement System

A new procurement system was lay down with the aim to reduce the cost incur in adhoc purchase, to ensure regular supply, and to increase the quality of drugs on competitive prices. Quality control mechanism was set up by appropriate and adequate inspection and good manufacturing practices which were based on the recommendation of the WHO.

Drug Formulary & Training

To ensure rational prescriptions by the doctors and paraprofessionals many training courses were organized and at the same time Delhi State Drugs Formulary was prepared to make it available to all doctors in the government services. This drugs formulary contained the information on category of drug, indications, cautions, contraindications, side effects and drug interaction, dosages and dosage forms. Standard Treatment Schedules was also prepared for the primary health care and dispensaries containing diagnostic information, therapeutic information, and patient information. Now many state government too have developed Standard Treatment Guidelines (STGs) for use within the state government health facilities. The Armed Forces Medical College (AFMC) has developed STGs for quite large number of common conditions and the treatment cost is alsoe calculated (AFMC 2007).

National List of Essential Medicine

The first National List of Essential Medicines of India was prepared and released in 1996. To address the issues of changing disease prevalence, treatment modalities, introduction of newer medicines and identification of unacceptable risk-benefit profile as well as therapeutic profile of some medicines, it was considered the need for updating the NLEM. Revision of NLEM was also based on the two important national reference documents i.e., Indian Pharmacopeia 2010 and National Formulary of India, 4th Edition, 2010. For essentiality of requirement the medicines have been categorized as follows: - P, S and T denote essentiality at Primary, Secondary and Tertiary levels respectively. A total of 348 medicines (excluding repetitions) are present in NLEM 2011. In the NLEM 2011, 181 medicines fall under the category of P, S and T, 106 medicines fall under the category of S, T while 61 medicines are categorized as T only.

To make this program successful all stakeholders should play their critical role such as medical and nursing college and private practitioners (Kar et al 2010). Training programs should be strengthened.

References

AFMC. Standard Treatment Guidelines: Medical Management and costing of selected conditions. 2007.

Govt. of NCT Delhi. Drug Policy Statement of Delhi State (1994), Department of Health, New Delhi.

Govt. of India. ELEM 2011. MOHFW 2001.

Drive against spurious medicines being stepped up. http://www.indiamedicaltimes.com/2013/08/24/drive-against-spurious-medicines-being-stepped-up/

Kar SS, et al. Concept of essential medicines and rational use in Public Health. Indian Journal of Comm Medicine 2010; 35 (1): 10-13.

Sharma S, Sethi GR, Gulati RK. Standard Treatment Guidelines. Delhi Society for Promotion of Rational Use of Drugs 2002.

WHO. http://apps.who.int/medicinedocs/en/d/jh3011e/2.html.

WHO. WHO Model Formulary, Geneva: WHO press 2004.

CHAPTER 29

PHARMACOVIGILENCE PROGRAM OF INDIA

INTRODUCTION

The Central Drugs Standard Control Organization (CDSCO), New Delhi has initiated a nation-wide pharmacovigilance program under the aegis of Ministry of Health & Family Welfare, Government of India in 2010. The program is coordinated by the Indian Pharmacopoeia Commission (IPC) located at Ghaziabad for monitoring Adverse Drug Reactions (ADR) in the country for safe-guarding Public Health. The National Coordinating Centre is operating under the supervision of Steering Committee to recommend procedures and guidelines for regulatory interventions.

Before registration and marketing of medicine in the country, its safety and efficacy experience is based primarily on the use of the medicine in clinical trials. These trials mainly detect common adverse reactions. Some important reactions, such as those, which take a long time to develop, or those, which occur rarely, may not be detected in clinical trials. In addition, the controlled conditions under which medicines are used in clinical trials do not necessarily reflect the way they will be used in practice. For a medicine to be considered safe, its expected benefits should be greater than any associated risks of harmful reactions. So in order to gain a comprehensive safety profile of medicine, a continuous post-marketing monitoring system i. e. Pharmacovigilance is essential. In order to monitor the safety of medicine information from many sources are used for pharmacovigilance. These include spontaneous adverse drug reaction (ADR) reporting mechanism, medical literature published worldwide, action taken by regulatory authorities in other countries, etc.

Besides other database the USFDA and WHO are big enough to perform data mining and to check if any drug has been found to be causally associated with and significantly responsible for any serious and hitherto unknown side effects. Therefore, CDSCO takes decisions based on the data obtained from the Indian population with the addition of more and more data from developed countries. On Pharmacovigilance,

So far 2823 number of ADRs has been reported since September, 2010 under the Pharmacovigilance Program. This database is very small to draw any conclusion related to the drug being implicated for a particular serious side effect. Also, this database includes data for a large number of drugs and includes non serious adverse drug reactions data also besides the serious side effect data.

Since there exist considerable social and economic consequences of adverse drug reactions and the positive benefit/cost ratio of implementing appropriate risk management – there is a need to engage healthcare professionals and the public at large, in a well structured program to build synergies for monitoring adverse drug reactions in the country. The government and private medical colleges are the corner stone of the Pharmacovigilance Program of India. They act as peripheral Adverse Drug Reaction Monitoring & reporting (ADR) Centers, responsible for collecting the ADR reports, performing the follow up with the complainant to check completeness of the ADR reports as per Standard Operating Procedures (SOP's) and to enter the Data in the prescribed software

(Vigiflow) to report to National coordinating Center at IP Commission.

Technical support will be provided by a) Signal Review Panel; b) Core Training Panel and c) Quality Review Panel.

The ADR reports will be collected from MCI approved medical colleges and hospitals, private Hospitals, public health programs, autonomous institutions (ICMR etc).

Mission

Safeguard the health of the Indian population by ensuring that the benefits of use of medicine outweighs the risks associated with its use

Vision

To improve patient safety and welfare in Indian population by monitoring the drug safety and thereby reducing the risk associated with use of medicines.

Objectives

- To create a nation-wide system for patient safety reporting
- To identify and analyze the new signal (ADR) from the reported cases
- To analyze the benefit - risk ratio of marketed medications
- To generate the evidence based information on safety of medicines
- To support regulatory agencies in the decision-making process on use of medications
- To communicate the safety information on use of medicines to various stakeholders to minimize the risk
- To emerge as a national centre of excellence for pharmacovigilance activities
- To collaborate with other national centers for the exchange of information and data management
- To provide training and consultancy support to other national pharmacovigilance centers located across globe

Implementation of PvPI

Indian Pharmacopoeia Commission understands the need for establishing local hospital based centers across the nation for the better patient safety. It is important to monitor both the known and hitherto unknown side effects of medicines in order to determine any new information available in relation to their safety profile. In a vast country like India with a population of over 1.2 billion with vast ethnic variability, different disease prevalence patterns, practice of different systems of medicines, different socioeconomic status, it is important to have a standardized and robust pharmacovigilance and drug safety monitoring program for the nation. Recent development of drug resistant diseases such as tuberculosis, malaria, leprosy, Urinary tract infection, typhoid should be taken seriously. There is a need to strengthen the mechanism for continuing professional development of clinicians to update their knowledge and skills to prescribe rationally and also able to monitor themselves. In case of resistance or adverse effect should be able to report to the authorities.

To handle drug resistant, cost of drugs and essential prescription, Indian Government instructed to all Central Government hospitals and Central Government Health Scheme (CGHS) dispensaries to prescribe generic medicines in large extent as possible. Physicians are also instructed by State Government to prescribe generic medicines. Department of Pharmaceutical, ministry of chemical and fertilizers, in collaboration with the State Government commenced nationwide "*Jan Aushadhi Campaign*" (Medicines for Public Campaign) by way of launching '*Jan Aushdhi*' generic drug stores in the Government hospitals and supply of generic medicine through Central Pharma Public Sector Undertaking. Till mid of 2012, Government has already opened 122 *Jan Aushdhi* stores, where about 231 generic medicines are being marketed.

References

Bajait CS et al. Evaluation of knowledge, attitude and practice of rational use of medicines among clinicians in a tertiary care teaching hospital. Int J Nutr Pharmacol Neurol Dis 2014;4:153-7.

http://www.ipc.gov.in/index1.asp?linkid=222

CHAPTER 30

PROGRAMS & SCHEME FOR DISABLED PERSONS

INTRODUCTION

Only 2% disabled children in the developing world receive any education or rehabilitation. Most public buildings and transport systems throughout the world are inaccessible to the majority of disabled people. Disabled people of working age in developed and developing countries are three times more like to be unemployed and love in real poverty. Disabled people are subjected to appalling abuse.

According to the Census 2001, there are 2.19 crore persons with disabilities in India who constitute 2.13 percent of the total population. This includes persons with visual, hearing, speech, locomotor and mental disabilities. 75 % of persons with disabilities live in rural areas, 49% of disabled population is literate and only 34% are employed. According to UN the disability in India is around 10% in 2011. In current census there are 1.2 billion population and 833 million lives in rural areas. The earlier emphasis on medical rehabilitation has now been replaced by an emphasis on social rehabilitation. There has been an increasing recognition of abilities of persons with disabilities and emphasis on mainstreaming them in the society based on their capabilities.

The concept of disability differs from society to society. Because attitudes towards disability are deeply rooted in sociocultural values, the term 'disability' has been defined in many ways. Besides, other term, 'impairment' and 'handicap' have been synonymously used for disability. The World Health Organization (WHO) defines each term distinctly.

Impairment is any loss or abnormality of psychological, physiological or anatomical structure or function.
Disability is any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being.
Handicap is a disadvantage for a given individual, resulting from impairment or a disability that limits or prevents the fulfillment of a role that is normal (depending on age, sex and social and cultural factors) for that individual.

The WHO definitions have often been criticized for focusing only on the individual and failing to reflect the extent to which the lives of disabled people are disadvantaged by the social structures of the society to which they belong.

In a world in which there is increasing sensitivity to human rights and equality, one must view disability from a social perspective. The social model defines disability as the loss or limitation of opportunities to take part in the normal life of the community on an equal level with others due to physical and social barriers.

Between 5 and 10% of Indians have some impairments

or disabling conditions. This means that India has a huge population of disabled people. At the policy level, progressive legislation, schemes and provisions exist for them. But at the ground level, the disabled continue to be neglected and marginalized, with the onus of care on the family rather than the community. India needs to mark a shift from the medical model of intervention to community-based rehabilitation of the disabled.

In addition to the legal framework, extensive infrastructure has been developed. The following seven national Institutes are working for development of manpower in different areas, namely,

- Institute for the Physically Handicapped, New Delhi.
- National Institute of Visually Handicapped, Dehradun
- National Institute for Orthopedically Handicapped, Kolkata
- National Institute for Mentally Handicapped, Secunderabad.
- National Institute for Hearing Handicapped, Mumbai
- National Institute of Rehabilitation Training & Research, Cuttack.
- National Institute for Empowerment of Persons with Multiple Disabilities, Chennai.

There are five Composite Rehabilitation Centres, four Regional Rehabilitation Centres and 120 District Disability Rehabilitation Centres (DDRCs) providing various kinds of rehabilitation services to persons with disabilities. There are also several national institutions under the Ministry of Health & Family Welfare working in the field of rehabilitation, like National Institute of Mental Health and Neuro Sciences, Bangalore; All India Institute of Physical Medicine and Rehabilitation, Mumbai; All India Institute of Speech and Hearing, Mysore; Central Institute of Psychiatry, Ranchi, etc. In addition, certain State Government institutions also provide rehabilitation services. Besides, 250 private institutions conduct training courses for rehabilitation professionals.

National Handicapped and Finance Development Corporation (NHFDC) has been providing loans on concessional terms for undertaking self-employment ventures by the persons with disabilities through State Channelizing Agencies.

Panchayati Raj Institutions at Village level, Intermediary level and District level have been entrusted with the welfare of persons with disabilities.

India is a signatory to the Declaration on the Full Participation and Equality of People with Disabilities in the Asia Pacific Region. India is also a signatory to the Biwako Millennium Framework for action towards an inclusive, barrier free and rights based society. India is currently participating in the negotiations on the UN Convention on Protection and Promotion of the Rights and Dignity of Persons with Disabilities.

SCHEME OF INTEGRATED EDUCATION FOR THE DISABLED CHILDREN

Disabled children face hardship in their lives everyday and suffer in silence. Their parents and other family members also suffer physically and economically. It is found that 60% of the families of mentally handicapped children were severely burdened with the adverse effects on the family's physical and psychological health. Members of family, frequently the mother became depressed (Gathwala & Gupta 2004).

This is a centrally sponsored scheme for disabled children launched in 1974 by the Department of Social Welfare which was transferred to the Department of Education in 1982. There is 100% assistance to the state and Union Territories for education of children suffering from certain mild handicaps in common schools. The following types of disabled children are covered:

1. Locomotor handicap (OH),
2. Mild and Moderate hearing impaired,
3. Partially sighted children,
4. Mentally handicapped educable groups (IQ 50-70),
5. Children with multiple handicaps, and
6. Children with learning disabilities,

The following allowance and facilities are provided:

1. Books and stationary allowance of Rs. 400 per annum,
2. Uniform allowance of Rs. 50 per month,
3. Transport allowance of Rs. 50 per month,
4. Reader allowance of Rs. 50 per month in case of blind children after class V,

5. Escort allowance for severely handicaps child with lower extremity deformities Rs. 75 per month,
6. Actual cost of equipments subject to a maximum of Rs. 2000 per student for a period of five years, and
7. Special facilities for hostels and payment for boarding and lodging charges are also provided.

Visual Impairment

Louis Braille's invention of Braille alphabet system is 1832 provided a tremendous impetus to education of visually impaired children throughout the world. The education of visually impaired children in residential schools is an accepted model all over world (Mani 1997). The first school for the blinds in India was started by Christian Missionaries in 1886 in Amritsar. There are 300 'special schools' in India which serve approximately 30000 visually impaired school going children. After gaining primary education from these schools those children can be placed in regular schools in the general education system. However, such regularization does not normally occur.

Low vision children

There are programs to educate, rehabilitate, and integrate the blind with normal population. But there is a group of children between blinds and sighted children having low vision who are at a disadvantaged position. Confusion, whether they should read print or learn and use of Braille. In addition these low vision children did not have the encouragement in the past to use residual vision. It is found that the defective eyes are more used and any kind of optical aids i.e. magnifiers, low vision aids (LVA) would be useful.

Rehabilitation of blind

A blind person needs following types of rehabilitation:

a) *Medical Rehabilitation:* by providing LVA many visually impaired can benefit from their residual useful vision.
b) *Training and psychosocial rehabilitation:* It is an important aspect of management. Each blind should be assured and made to feel that they are equally useful and not inferior to sighted person. Their training should include: mobility training and training in living skills- bathing, washing, etc.
c) *Educational Rehabilitation:* Visually impaired children should be sent to 'special schools'. After gaining primary education from these schools these children can be placed in regular schools.
d) *Vocational Rehabilitation:* Taught simple occupations like candle making, chalk making, chair canning, etc. however, these have lost their economic value now a days. Efforts should be made to discover new economically useful occupations for blinds. For example engineering occupations which can be performed by blinds, assembly work, milling machine, drilling machine, and capstan lathe, etc. Occupations like dairy farming, animal husbandry, poultry keeping, *mudha* making, rope making in rural area by the blind are useful.

Employment Opportunities: Educated blind can seek employment in all government, where there is reservation for visually handicapped. Government of India has set up 47 special employment exchanges in different states for visually handicapped. The Ministry of Rural Development has reserved 3% vacancies for the disabled in the integrated rural development program as well as in all other poverty alleviation programs.

Concessions to the blind: Travel concession by rail -50-75%, and by air (50%) are provided to the blind. Post and telecommunication department provides free postage of literature for blind and issuing telephone connections. Custom exemptions are available on Braille paper and audio cassettes for blinds. Conveyance allowance for blind employee to the maximum of Rs. 100 per month. Income tax concession, award of dealership/ agencies of oil company are also available. 1% jobs are fixed in government for blind. Scholarships to the disabled and awards for visually handicapped are available.

DISTRICT DISABILITY REHABILITATION CENTER

The Government of India launched DRC scheme in early 1985, for providing a package of model comprehensive rehabilitation services to the rural disabled. The scheme, at present is operated in 11 different places of the country. The scheme covered following groups of impairment and handicap:

1. Locomotor handicap (OH),

2. Speech and hearing impaired,
3. Visually impaired,
4. Mentally handicapped, and
5. Multiple handicaps.

Services provided through these centers are:

1. Preventive and early detection,
2. Medical intervention and surgical correction,
3. Figment of artificial aids and appliances,
4. Therapeutic services such as physiotherapy, speech therapy, and occupational therapy,
5. Provision of educational services in special and integrated school,
6. Provision of training, for acquisition of skills through vocational training, job placement in local industries and trade with proper linkages with on going training and employment programs,
7. Provision of self employment opportunities and bank loans,
8. Establishing a meaningful linkage with existing government scheme such as disability/old age pension, scholarship, etc., and
9. Creating of awareness movement of community and family counseling.

At Village Level: Anganwadi worker, Teacher, health workers, etc., undertake the work of prevention, detection, and referral to PHC/CHC/District Hospital or voluntary organizations.

At PHC/CHC Level: Medical officers and paramedical staff are trained and oriented to prevent, detect, and appropriate intervention at their level and timely referral to high centers.

DRC Level: district unit (1) provide services to handicap, (2) Act as referral center to PHC/CHC and for village level staff, (3) organizing camps, (4) education, vocational training, coordinating work with voluntary agencies and other departments.

A total of 199 District Disability Rehabilitation Centres (DDRCs) have been approved in the country. The Government also planned to set up 100 new District Disability Rehabilitation Centres in the country in 2010-11 and 2011-12.

Regional Rehabilitation Training Centers were set up in Lucknow, Chennai, Cuttack, Mumbai to provide technical support to the DRCs.

NATIONAL PROGRAM FOR REHABILITATION OF PERSONS WITH DISABILITIES

Disability rate is assessed by prevalence rate that is number of disabled per 100,000 population. For male the rate is 2000 per 100,000 and for female it is 1493. Rate in Delhi is 0.71% in 2002. Highest disability rate has been observed in Himachal Pradesh (2571 per 100,000 population). Out of total, 12.66% is due to mental disability, 7.13% due to visual, 5.2% due to communication, 68.37% due to locomotor, and 6.64% is due to multiple disabilities. Disability was more in rural than urban areas.

Objectives

1. To create services delivery system at state/district block/gram panchayat level so as to provide comprehensive based rehabilitation services.
2. Prevention, early intervention and information dissemination.

Implementation

There is a provision of 2 community based rehabilitation workers at each gram panchayat and 2 multipurpose rehabilitation worker at block level. Services at district level would be provided through various professionals like physiotherapist, occupational therapist, orthotic and prosthetic engineer, etc. The Program is being implemented as a state sector scheme through state government /local body.

Financial Assistance to social and Physical Handicapped Persons

In the event of disability (min 40%) or old age gets Rs. 5000 once in a life time through cheque in Delhi. There are provisions of financial assistance for purchase of Aids (90% and 50% of the cost), owning a motorized vehicle (50% subsidy), and student also get stipend of Rs. 50 per month from class I to V and Rs. 70 per month from VI to VII. There is a provision of scholarship of Rs. 250 to 1000 per month depending on class, disability, day scholar or hosteler, etc. (Govt. of NCT Delhi).

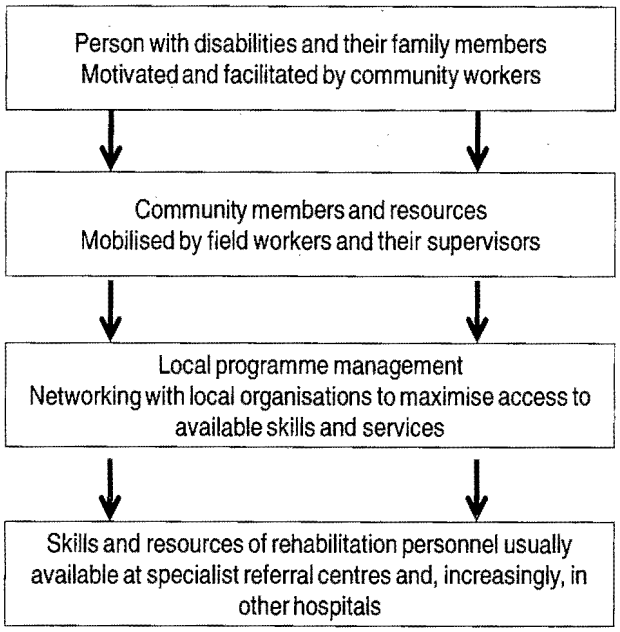
COMMENTS

World Blind Union, World federation of the Deaf, World Network of Users of the psychiatric system and

Rehabilitation International are working to remove the suffering of disabled. Global Health Watch 2005-2006 has recommended following:

- Listen to the voices of the excluded. Promote and support the voice and status of disable people.
- Understand the mature of exclusion- establish longitudinal data sets based on environmental impacts to monitor disabled people's lives.
- Look for solutions through equality, inclusion and rights. Society has to change, as well as routine daily behavior.
- Ensure the disability dimension is included in all agendas-especially poverty and development.
- Build alliances to make a difference.
- Include disabled people in the monitoring of all human rights instruments and promote an international convention on the right of disabled people.
- Above all, recognize the intrinsic humanity of each disabled person, regardless of impairment.

Delivery of CBR service


Person with disabilities and their family members
Motivated and facilitated by community workers
Community members and resources
Mobilised by field workers and their supervisors
Local programme management
Networking with local organisations to maximise access to available skills and services
Skills and resources of rehabilitation personnel usually available at specialist referral centres and, increasingly, in other hospitals

COMMUNITY BASED REHABILITATION

"CBR is a strategy within general community development for the rehabilitation, equalization of opportunities and social inclusion of all people with disabilities. CBR is implemented through the combined efforts of people with disabilities themselves, their families, organizations and communities, the relevant governmental and non-governmental health, education, vocational, social and other services".

CBR as it developed in the late seventies and early eighties was largely a response to the physical rehabilitation needs of many disabled people who by that time were not reached through so-called institution based rehabilitation. CBR became an approach to make rehabilitation accessible to disabled people at the community level. CBR in those days developed from within a medical model perspective, implemented in the context of the health sector, and was concerned with coverage. CBR in those early years focused mostly on the notion of "Rehabilitation for All", much in line with the WHO strategy of "Health for All". There was nothing wrong with it and those who seriously want to address the vast needs of the majority of disabled people living in lesser developed countries should still take note of the early ideas. If the current coverage and access to rehabilitation services is compared with the situation some thirty years ago it may very well be that the situation on the ground has not much improved in the world and similarly lacking in India. CBR remains limited to pockets of - more or less acceptable standards of rehabilitation services. However, all too often it is limited in terms of coverage, scope and comprehensiveness. In spite of many initiatives worldwide and in spite of renewed interest in CBR the real situation is that the majority of disabled people do not have any access to any form of rehabilitation. Unfortunately this notion seems not to be heard anymore. It appears as though CBR is now well-accepted and applied. However, even in countries claiming to have national programmes such as Vietnam, the coverage is limited and while many provinces may have CBR (74% coverage), it is a few districts in those provinces (24% coverage) and a few villages in those districts (24% coverage) that in actual fact benefit from the national CBR programme. Similar examples can be given from other parts of the world. CBR should to be established in India to handle the disability felt need.

Arrangements for the delivery of primary level CBR services vary according to the local situation. Depending on which organisations exist, CBR services may be delivered through some or all of the following:

- through community based organisations
- through organisations of people affected by leprosy or disabilities
- through voluntary, non-government organisations
- through government services.

The work may be further supported by networks of community based, local government and non-government organisations combining to provide resources, to develop skills or to conduct interventions that contribute to a comprehensive rehabilitation service for people with disabilities.

References

Cornielje H. The Role and position of disabled people's organization in community based rehabilitation: Balancing between dividing lines. Asia Pacific Disability Rehabilitation Journal 2009; 20 (1): 3-14.

Gathwala G, Gupta S. Family Burden in Mentally Handicapped Children. Ind J Com Med 2004; 29: 188-189. Mani MNG. Techniques of teaching blind children. New Delhi: Sterling Publishers 1997.

Rehabilitation Council of India. A Curtain raiser. Concessions given by the central government for the disabled.

Sood S, Nada M, Nagpal RC. Psychosocial implications of blind child. Ind J Com Med 2004; 29 (2) 94-95.

Govt. of NCT Delhi. Citizen Charter: Department of Social Work. GLNS Complex Delhi Gate 110002.

Govt. of India Ministry of Social Justice & Empowerment. Programs and Concessions to the persons with disabilities through the central government 1999.

Govt. of India Ministry of Social Justice & Empowerment. Programs and Concessions to the persons with disabilities through the central government 1999.

Govt. of India. Annual Report 2000-2001. Min of H & FW, Nirman Bhawan, GOI, New Delhi.

Govt. of India. National Policy for Persons with Disability. Ministry of Social Justice and Empowerment. Government of India 2006.

Helander, E. Prejudice and Dignity, Second Edition. 1999

CHAPTER 31

NATIONAL PROGRAM FOR PREVENTION OF BURN INJURIES

INTRODUCTION

India, the second most populous country in the world with over a billion people has an estimated annual burn incidence of 6-7 million, based on data from major hospitals when extrapolated to whole of the country, which is the second largest group of injuries after road accidents. Because of lack of system for notification and central registry facts and figures are estimates only. However, nearly 10% of these are life threatening and require hospitalization. Approximately 50% of those hospitalized died due to their injuries. Seventy percent of the burn victims are in most productive age group of 15 to 40 years and most of the patients belong to poor socioeconomic strata. Nearly 1 to 1.5 lakh people get crippled and require multiple surgeries and prolonged rehabilitation. Organized burn care is possible in developed world because there is direct or indirect involvement of the government, universal health insurance cover, legislation like right to health is in place and high level of safety awareness in public. Such luxuries do not exist in developing countries like India.

The burn scenario is grave not only due to the high incidence but is also compounded by absence of organized burn care at primary and secondary health care level. But there is a silver lining to this grim situation, that 90% of all burn injuries are preventable. However, absence of stringent law regarding environmental safety, substandard manufacturing of household electric and cooking equipments and general lack of safety consciousness fail to prevent this problem. Usually the management of burn cases require huge infrastructure and resources cause less willingness of government and private hospital to have such burn units. Even in the capital city of Delhi, there are less than 200 beds for burn management to cater to the need of a population of over 16 million. The recent rise in the incidents of bomb blasts, and manmade disasters in industries and offices contributing to quantum jump in burn Injury cases also calls for national preparedness to cope with the challenge of this Public Health Problem.

Guiding Principles

The National Program for Burn Injuries shall be set up and function with the following Guiding Principles:

- To optimally and effectively utilize the existing health care and allied sectors services and infrastructure;
- To elicit participation of Government, Non Government and private/corporate sector to avoid duplication of efforts and expenditures;
- To evolve three tier program structure to have universal coverage and reach;
- The Program shall have balanced focus on preventive, curative and rehabilitative aspects of Burn Injuries; and
- To establish a central burn registry.

Program structure

To establish and manage the program, a defined program management will be structured under the following headings: a) Program Division in Directorate General of Health Services; b) A program officer with Public Health / Health Promotion and Education qualifications; c) Consultants in Burns, Rehabilitation and Health promotion and Education specialties; d) Requisite support staff; e) A National Burn case reporting mechanism; f) Utilizing MIS in the country from Sub centre>PHC>CHC>District Administration>State> Centre; and g) A co-ordination committee.

Experts from Burns and Plastic surgery, Physical medicine and Rehabilitation, Health education and health promotion to guide, oversee, supervise and evaluate the NPPBI program activities.

Collaboration and convergences

In the present set-up there are many players working directly or indirectly for prevention of Burns and other traumas, First aid and transportation facilities. Their services should continued to be utilized for further improvements in the burn care. Various departments involved are:

- MOH and FW through its Health services infrastructure e.g. Departments of Burns and plastic, causality services (Secondary and tertiary prevention/curative care)
- Fire Services, Ministry of Home Affairs
- Education Department (HRD)
- Women and Child Ministry (ICDS)
- Local Self Governments (PRI)
- Civil Defence and Home Guards (Ministry of Home Affairs)
- Police Department
- Others

Strategies

To address the various dimensions of the problem of Burn Injuries and to fill the identified gaps in the existing public health care delivery system the "National Program for Prevention of Burn Injuries" requires multi pronged strategy. The program would essentially have three components:

1. Burn injury Prevention program
2. Burn injury Management program
3. Burn injury Rehabilitation program

1. Preventive program

Strategies

- Development and implementation of an appropriate, need based communication/ behavior change communication (BCC) strategy.
- Advocacy with the Policy makers, Administrators in Health and Allied Sectors, Corporate and Industry sectors.
- Developing key messages for general public and special target groups such as healthcare providers at primary, secondary and tertiary level for vulnerable groups e.g., women and children, industrial workers and so on. It would be necessary to maintain consistency in the messages through out.
- Media engagement strategy
- A National commemorative day/ week for prevention of Burn Injuries
- Communication organizational structure at centre, state, district, PHC level
- Capacity building program for IEC/ BCC manpower at all the three levels
- Monitoring and Evaluation of Communication interventions for prevention

Activities

- Situation analysis (Formative research): To be undertaken by institution like ICMR/MCI to provide a base line data pertaining to the specific behavior to be changed for communication/BCC strategy.
- Meeting with policy makers, administrators, Parliamentarian, legislators, *panchayat surpunch* and members and convincing them for the program.
- Campaigns during parliament/Assembly sessions. Printing informative brochures etc.
- Networking with active partners: Bureaucrats, Stakeholders from Private and Corporate sectors and NGOs, Professional associations.
- Integration with ongoing educational and training activities
- Fulfilling personnel requirement at different levels
- Capacity development of available manpower
- Health communication through media mix as per local needs
- Commemorative Burn Prevention week to be observed across the country

Monitoring and evaluation: Routine monitoring shall be done through existing monitoring system at National and State level or evaluation by an external agency

2. Burn injury management program

The main strategies for Burn care would be to provide physical infrastructure and manpower for Burn care at all three levels of health delivery system through inter agency coordination and Public private partnership. This will be achieved through provision of material resources and capacity building programs for easy accessibility, equity and universal coverage. Quality management and Monitoring would be done to ensure maintenance of standards.

For quality burn injury management at all the three levels of healthcare delivery system there would be certain additional requirement of following:

Primary level

The existing space available will be utilized for various activities and the existing staff (such as ANMs, nurses, dressers, etc.) will be sensitized and trained on burn first aid.

District level

A small 4-6 bedded Burn unit will be set up in district hospitals. The existing operation theatre and other facilities will be utilized but will be augmented by providing basic equipment such as Vital parameter monitor, Skin graft mesher, Humby's knife, Portable light etc. and partly the consumables will also be provided. One Advanced Life Support Ambulance per district with manpower will be provided.

Tertiary level

Capacity building is required in all the major tertiary hospital and facilities by providing additional infrastructure and manpower. A Burn Unit of 12 beds including an ICU of 4 beds will be created. The existing operation theatre and other facilities will be utilized but will be augmented by providing basic equipment such as Ventilators, Vital parameter monitors, Skin graft mesher, Humby's knife, Portable lights, Dermatome etc.

Training program for capacity building of burn care manpower

The Surgeons/Medical officers at the district level, two from each district shall be trained by the Burns and Plastic surgeons at the medical college/ Selected Training Centers. Training of the district level workers will be done at district hospitals by the trained Surgeons and Medical officers in Burn care. Orientation training of the primary level workers will be done at district centre by the Surgeon /Medical Officers. On the job Training of the medical college workers will be done at existing burn centers routinely.

3. Burn injury rehabilitation program

The essential components of Rehabilitation of Burn Injuries would encompass development of infrastructures- physical, manpower and materials with capacity and skill development initiatives. It will be equitable, accessible and with universal outreach. Inter agency coordination and public private partnership will be used. Monitoring and quality control will be done. Services to be provided at three levels will be as follows:

Primary level

The main stress would be to integrate with the villagers through the Anganwadi workers and other community level functionaries for awareness generation regarding scar management, therapeutic exercises with home exercise program, splinting, electrotherapy modalities (Cold, Heat etc.) and activities of daily living (Modifications and equipments).

District level

To set up fully equipped Burns Rehabilitation Centre in approximately 300 sq ft area with a basic team consisting of a surgeon, 3 physiotherapist/occupational therapist and members like multi rehabilitation workers who can be a pivotal link between the three tiers of the system. The services of a psychologist and vocational counselor can be utilized on fixed days basis. Equipment such as diathermy, ultrasound, electrical stimulators and traction equipments will be provided.

Tertiary level

At this level every possible facility and information related to complete burn rehabilitation should be available. This includes issues on pre and post operative assessments and planning, execution of treatments. Disability certificates, vocational guidance and placements, monetary assistance through various resources, functional prosthesis and compilation of

various Government and Non Government organizations working in this sector. A special group of Burn care professionals should be allotted with the work of patient out come assessments.

National Registry for Burns

A National Burn Registry will be set up utilizing MIS in the country from public health system such as sub centre, PHC, CHC, District Hospital, State level and Central level institution or ministry. This will help in future planning of various strategies for the program in the country.

Implementation of program

Program will be implemented in phase manner starting with few states involving few Medical colleges and their adjoining Districts. Then in the next five year plan it will be rolled out in all the medical colleges and districts hospitals of the country so that burn care is provided as close to the site of accident as possible and patients need not to travel to big cities for burn care.

Expectation

In a developing country like India with a population of more than 1.2 billion and a very high incidence of burn injuries, lack of life insurance cover and megre facilities for burn care in government as well as private sectors, a national initiative in the form of National Program is required to provide organized burn care at village level. When National Program for Prevention of Burn Injuries is in place there are going to be preventive activities at the lowest level of health delivery system and even first aid facilities will be available at this level. We will have burn care management and rehabilitation facilities by trained manpower in each and every district hospital and Medical College of the country. There will be about 700 to 800 dedicated ICU beds and total 6000 beds available for burn care. Advanced ambulance for transportation of patient from accident site to appropriate burn unit will be available in the remotest areas. Besides this we will also be able to help the government in formulating policies for environmental safety for industrial workers, manufacturing safety and quality regulation of cooking and other appliances etc. We will also have a national burn registry to collect and compile the data for analyzing the causative factors, behavioral and social patterns and any other factors responsible for high incidence of burn injuries and will also help us in planning future strategies for prevention and management of burn injuries. We hope that with National Program for Prevention of Burn Injuries we will be able to reduce the incidence and improve the care for burn injuries in the country.

Reference

Gupta JL, Makhija LK, Bajaj SP. National Program for Prevention of Burn Injuries. Indian J Plast Surg. 2010 September; 43 (Suppl): S6–S10.

CHAPTER 32

NATIONAL TRAUMA SYSTEM IN INDIA

Injury is a major public-health problem however the government, medical fraternity and the society are yet to recognize it as a growing challenge. Rapid urbanization and industrialization have led to an alarming increase in the rate of accidental injuries, crime and violence in India. An unprecedented increase in the number of vehicles has outpaced the development of adequate roads and highways. India has 1% of the motor vehicles in the world, but bears the burden of 6% of the global vehicular accidents.

Road-traffic accidents are increasing at an alarming annual rate of 3%. In 1997, 10.1% of all deaths in India were due to accidents and injuries (Sethi & Tyagi 2001). A vehicular accident is reported every 3 minutes and a death every 10 minutes on Indian roads (Joshipura 1996) . During 1998, nearly 80,000 lives were lost and 330,000 people were injured. Of these, 78% were men in age group of 20-44 years, causing significant impact on productivity (WHO 2001) . A trauma-related death occurs in India every 1.9 minutes (Sethi & Tyagi 2001). The majority of fatal road-traffic accident victims are pedestrians, two wheeler riders and bicyclists (WHO 2001).

It is established that the mortality in serious (ISS > 16) injuries is six times worse in a developing country such as India compared to a developed country (Mock 1998). Despite trauma being a major public-health problem with high morbidity and mortality, the Ministry of Health does not have a designated unit to deal with issues related to trauma. There is no central government agency to integrate policy-making, planning, financing, drafting legislation or establishment of minimum standards for the performance of a trauma-care system. No reliable institutional arrangement exists to lead the development of such a system in any Indian state. The Centralized Ambulance Transport Service (CATS) of the Government of the State of New Delhi is the only noteworthy state initiative in this direction.

It is well recognized that our health care system is not fully equipped to meet the challenge. Trauma-care system in India is poor, not appropriate and skewed distributed more in urban and does not provide quality services. Trauma life-support skills education is provided in some medical institutions.

The trauma systems operational in cities, with the exception of New Delhi, receive significant contributions from the private sector. In cities such as Mumbai, Chennai, Pune, Bangalore, Hyderabad, the trauma systems are in infancy.

No law exists to ensure prompt access to life-saving treatment for trauma victims. Recent enactment of Clinical Establishment Act forces every agency to provide emergency services regardless of payment which is strongly opposed by medical fraternity. Each trauma care in trauma centers and critical care units need to be accreditated. Each health personnel should

receive mandatory training in life saving skills. Legislative provisions for the minimum qualification of ambulance personnel, the type and quality of ambulance equipment and essential hospital capabilities should be made.

Training and Skill Development

The state medical and nursing councils control the medical and nursing educations for physicians and nurses. However, formal education and specialty training (in emergency medicine, trauma surgery and critical care) are not mandatory for personnel involved in trauma care and available at select private institutions. The standardized education in trauma life-support skills is made available through the efforts of Academy of Traumatology (India) under the 'National Trauma Management Course' (NTMC) with accreditation from the International Association for Surgery of Trauma and Surgical Intensive Care (IATSIC). The National Board of Examinations has recently begun registering courses in trauma care, though in a very limited manner. There are no minimum stipulated educational standards for paramedic and ambulance personnel. Paramedic training programs are offered in major institutions but there is no accreditation, review or provision for periodic update of skills and knowledge.

Prehospital Care

Prehospital care is absent in India particularly rural and semi-urban areas and implementation of the 'golden hour' concept is still an unachieved goal (Sethi & Tyagi 2001). The concept of a coordinating agency and a designated authority is restricted mainly to cities where trauma systems are operational in some form. Quite often there is an overlapping of private and public facilities and ambulance services in an urban geographical area. In the absence of guidelines and trained paramedical staff, decisions about evacuation of the victim and the choice of the destination hospital are made on an individual-case basis. These choices are often made at the behest of patients or their kin.

Formal licensing to run an ambulance service is not mandatory. Ambulance services are run by a multitude of organizations including government, police, fire brigades, hospitals and private agencies. Of the facilities surveyed, 12% reported a total absence of any ambulance service. Air ambulance services are not available even in most of the urban areas and only 4% of the surveyed systems have even minimal access to air transportation, run by private agencies. Some facilities surveyed even had to rely, at times, on waterways to transport injured victims.

No national or regional guidelines exist for triage, patient-delivery decisions, prehospital treatment plans and transfer protocols. Policies, procedures and regulations governing medical directions are in place only in some city systems. There are recent attempts to provide one-time formal training in prehospital care to the ambulance personnel in various parts of the country. Currently, only 4% of the ambulance personnel have any certified formal training. The number of paramedics in the ambulances varies considerably. One-third of ambulances serve only as transport vehicles with no paramedic staff. Only 28% of the ambulances have two or more paramedics. Only 50% of ambulance services reported skills and resources for providing airway support and appropriate splintage. The majority of ambulances have the means for intravenous infusion (74%) and blood-pressure measurement (62%).

Communication system

India in shining in information technology but communication in trauma systems remains efficient. Only 14% of the systems have a dedicated central telephone number for case reporting. Some 30% of the trauma systems, mainly in cities, are equipped with wireless communication. Only 4% of systems have a comprehensive network operational between hospitals and ambulances (Joshipura 2012).

Disaster Preparedness

In recent time incidence of disasters in India is increasing. However preparedness is poor as one can find non-availability of disaster plans which led to serious outcomes as seen in Koshi river flood and Uttrakhand Flood in 2013.

Definitive Trauma-Care facilities

Most government hospitals offer free care, but the quality of that care differs from one centre to another (Sethi & Tyagi 2001). Most medical college hospitals provide a reasonable level of care; these hospitals are able to fulfill the role of tertiary trauma centers but critical care remains a major concern. Private and

corporate hospitals, located mostly in large cities, are equipped with modern diagnostic and imaging facilities, good operating environments and intensive-care units. Some of them also run dedicated trauma services but liaison with public system is lacking and also standard protocols are not followed. The district hospitals often lack trained staff, adequate infrastructure for management of multiple trauma and supply of goods and consumables. Small can not manage severely injured patients, resulting in substandard care and high mortality.

Only 54% of the hospitals have set protocols for triage. In 30% of the hospitals, the casualty medical officers are the only physicians available to provide resuscitation. In acute and elective management of trauma patients, only 36% of the facilities follow or locally developed clinical protocols. There are no dedicated trauma surgeons in India. Orthopaedic surgeons lead the trauma response in 50% of facilities. In the remainder, the responsibility is not clearly defined. Clinical decisions are often delayed, in the absence of clear perceptions of clinical responsibility amongst specialists, putting patients with multi-system injury at a greater risk.

Rehabilitation

Rehabilitation should be the integral component of any trauma-care system but is highly neglected. It is restricted to physiotherapy in most centers. Although 76% of the facilities offer physiotherapy services, only a third offers occupational rehabilitation and psychological counseling. There is no linkage between trauma center and rehabilitation units. Social security, retraining, as well as employment and other support schemes from the government for the rehabilitation of the injured, are limited; only a few voluntary organizations offer such assistance.

Information systems

It is estimated that for every one death, nearly 10-20 people will get hospitalized and 50-100 will receive emergency care in hospitals (WHO 2001). The information systems in most places are manual and rudimentary. There is no central trauma registry in any state. Most hospitals have reliable data on trauma admissions, but only 40% have data on the clinical outcome of the trauma patients. Lack of such system also affect the management planning and assessing the impact of trauma management.

Evaluation and research

Monitoring of the performance of the system and its individual components, and any quality-improvement program are lacking. Very little work has been done to evaluate the working of trauma systems in India. CATS New Delhi (Govt of Delhi 2001) and CMC Hospital, Vellore (Suresh 2002) have assessed some components of their systems.

Future action

It is estimated that from its present position of the ninth leading cause of deaths in India, trauma will move up to third position by 2020. It is also estimated that in the developing countries over 6 million will die and 60 million will be injured, or disabled, in the next 10 years. India will have a large share in this, with an estimated economic loss of around 2% of GDP (WHO 2001). To meet this challenge several efforts are required: resource creation, education, legislation, upgrading prehospital and hospital based care, public awareness and a change in the attitude of the policy-makers. Under the NRHM the government has taken big step to start Integrated Highways Trauma Care system by Golden Quadrilateral Project linking North South and East West highways by establishing fully equipped trauma care center for every 100-150 Km on national highways and reaching the patients within 20 minutes of trauma by placing ambulance. Currently 1 per lakh population ambulation is available which increased to 5-10 per lakh.

References

Government of Delhi. Evaluation Unit, Planning Department. Report of Evaluation Study on CATS 2001.

Joshipura MK, Shah HS, et al. Trauma Care systems in India-An overview. Indian J Crit Care Med 2004; 8:93-7. http://www.ijccm.org/text.asp?2004/8/2/93/13805

Joshipura MK. Total Trauma Care: International Perspective. Hospital Today 1996;11:43-4.

National Crime Records Bureau, New Delhi. Accidental Deaths and Suicide in India 1999.

Sethi AK, Tyagi A. Trauma Untamed as yet. Trauma Care 2001;11:89-90.

Suresh DS. Trauma Systems in India - the CMC Vellore Experience, Asian Archives of Anaesthesiology and Resuscitation 2002;XLXII:21-3.

WHO South East Asia Regional Office, SCN Department, New Delhi - Disability, Violence - Injury, Prevention and Rehabilitation. News letter 2001 Vol. 2 No.1.

CHAPTER 33

NATIONAL EMERGENCY PREPAREDNESS PLAN: DISASTER MANAGEMENT

INTRODUCTION

Disaster is any occurrence that causes ecology disruption, loss of human life, and deterioration of health services on a scale sufficient to warrant an extraordinary response from outside the affected community or area. Disaster occurs suddenly and unexpectedly, disrupting normal life and infrastructure of social services including health care system. For this reason a country's health system and public health infrastructure must be organized and kept ready to act in any emergency situations as well as under normal conditions.

There are various types of disasters depending on its nature and etiology. High powered Committee of government of India has classified in following categories:

A. Water and climate related disasters

- Floods and Drainage related
- Cyclones
- Heat Waves & Cold Waves
- Tornadoes
- Droughts
- Sea Erosion

B. Geologically related disasters

- Landslides
- Earthquakes
- Dam Failures / dam bursts
- Mine fires

C Chemical, Industrial & Nuclear related disasters

- Chemical & Industrial disasters
- Nuclear disasters

D. Accidents related disasters

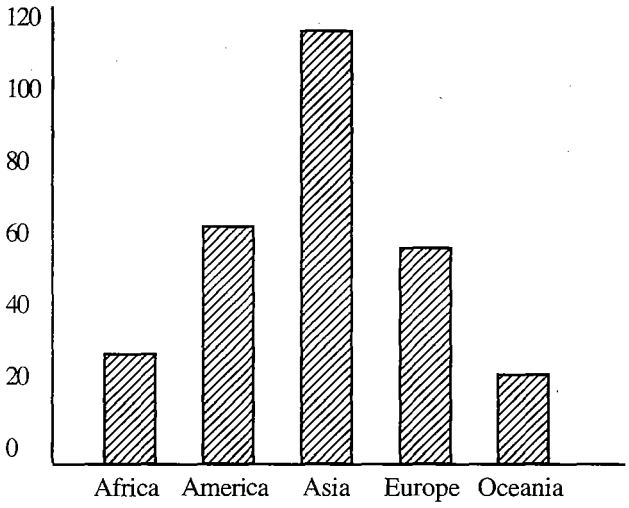
- Forest fires
- Urban fires
- Oil spill
- Mine flood
- Major building collapse
- Serial bomb blasts
- Festival related disasters
- Air, Road & Rail accidents
- Village fires

E. Biological related disasters

- Biological disasters and epidemic
- Pest Attacks
- Cattle Epidemic
- Food Poisoning

Except natural disasters all other disasters can be prevented. Natural disasters can be predicted and its impact can be reduced significantly. It has been estimated that number of disasters are more in Asian countries as compare to other part of the world (Figure 33.1). In recent time India has experienced very badly the impact of earthquakes in Maharashtra and Gujarat, super-cyclone of Orissa, Tsunami killer wave, Uttrakhand cloudburst, Kedarnath disaster, which made homeless and orphans lacs of people in many

Figure 33.1: Number of disasters with natural and non-natural triggers by global regions in 1994



(Source: World Disaster Report 1993)

states of the country and industrial disaster of Bhopal Gas leak in which thousands of people died and lacs of people disabled. India has witness large number of civil strife in which thousands of people have lost their lives till today. To prevent the damage from disasters internationally there were lot of deliberations and commitments for joint collaboration and actions. At the national level legal and institutional frameworks were also devised to manage the disasters.

INTERNATIONAL FRAMEWORK

- **The Yokohama Strategy** for a Safer World: Guidelines for Natural Disaster Prevention, Preparedness and Mitigation and its Plan of Action adopted in 1994.
- **IDNDR** [(1990-1999)- decade dedicated to promoting solutions to reduce risk from natural hazards]
- **Hyago Framework** Building the Resilience of Nation and Communities to Disasters 2005-2015.
- **Sendai Framework** for Disaster Risk Reduction 2015-2030.

LEGAL FRAMEWORK FOR DISASTER MANAGEMENT

- Epidemic Diseases Act, 1897
- Municipal Acts
- CrP C / CPC
- Water Act/ Air Act
- The Chemical Accidents (Emergency Planning, Preparedness, and response) Rules, 1996
- Biological Weapons Convention, 1972
- Environmental Pollution Act, 1986
- International Health Regulations (2005)
- National Disaster Management Act 2005
- Draft Public Health Emergencies Act
- Draft Public Health Act

INSTITUTIONAL FRAMEWORK

- National Disaster Management Authority
- National Crisis Management Authority
- State Disaster Management Authority/District Disaster Management Authority
- MOHFW/ State/ District Health Departments
- Primary Health Care systems
- Private Health and Medical Institutions
- Eminent Public Health institutions
- Non-Health Sectors:
  - Water Supply Department
  - Housing Department
  - Sanitation Department

Types of Central Response
(i) Policy response, and
(ii) Administrative response.

Policy response

There is a high level response to a natural calamity undertaken by the Prime Minister, Cabinet Committees and the Agriculture Minister. The objectives of policy response would be:

- to empathize with the sufferings of the people affected by natural calamity; and
- to sub-serve long term and short term policy objectives of the Government.

Policy response would lead to Central initiatives in the form of:-

1. Visits of the calamity affected areas by President, Prime Minister and other dignitaries;
2. Activating the administrative machinery for assisting in relief measures; and
3. Setting up machinery for implementing, reviewing and monitoring of relief measures.

Administrative response

The response of the administration to a situation arising out of a natural calamity can be on account of:

1. A follow-up of a policy objective of the Government;
2. The need for an assessment of the situation and for a central response;
3. States' requests for central assistance; and
4. The need for information as a governance objective.

The administrative response at the Central Government level would broadly relate to:-

A. Operational requirements

*(a) **The primary relief functions:*** of the Central Government would relate to:

- ✓ Forecasting and operation of warning system;
- ✓ Maintenance of uninterrupted communication;
- ✓ Wide publicity to warnings of impending calamity, disaster preparedness and relief measures through TV, All India Radio and Newspapers;
- ✓ Transport with particular reference to evacuation and movement of essential commodities and petroleum products;
- ✓ Ensuring availability of essential commodities at reasonable prices particularly the commodities through the Public Distribution System;
- ✓ Ensuring availability of medicines, vaccine and drugs;
- ✓ Preservation and restoration of physical communication links;
- ✓ Investments in infrastructure; and
- ✓ Mobilization of financial resources.

*(b) **The secondary functions:*** of the Central Government which supplement the States' relief efforts, would relate to:

- ✓ Flood/inflow forecasts from the Central Water Commission;
- ✓ Relief, rehabilitation and restoration through military aid to civil authorities;
- ✓ Contingency plans for crops, cattle preservation nutrition and health measures;
- ✓ Technical and technological inputs for provision of drinking water;
- ✓ Technical assistance in the water budgeting and water management for various uses; and
- ✓ Coordination of the activities of the State agencies and voluntary agencies.

Paradigm Shift in Disaster Management

Previously the focus of response was on relief and rescue operation which was changed to disaster mitigation and preparedness. Now there is further shift in disaster management. The focus is on vulnerability and risk reduction rather than just on mitigation and preparedness. The National disaster management Plan is to build a safer and disaster-resilient India by developing a holistic, proactive, multi-hazard and technology-driven strategy.

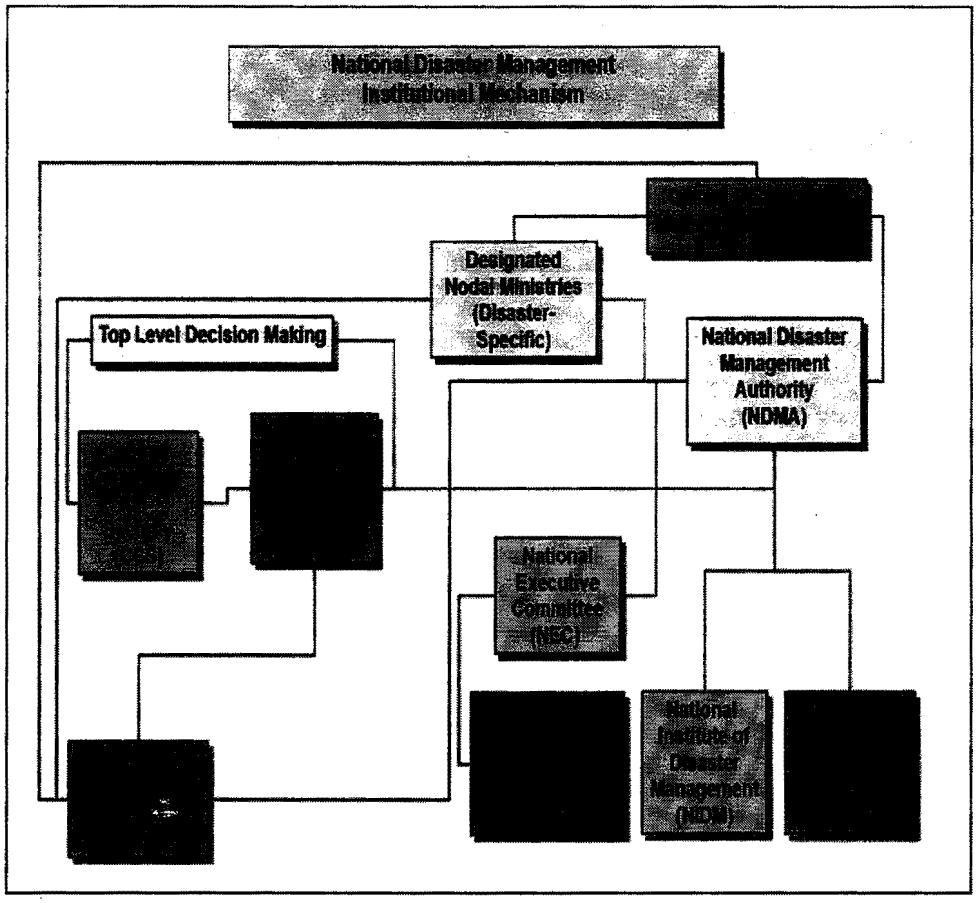
Mainsteaming is the process of assessing the implication of disaster risk in any planned development action from the policy to the program implementation level in all practice areas and at all levels. This process enables the incorporation of risk reduction concerns and experience as an integral dimension of the design implementation, monitoring and evaluation. A more integral approach calls for collaboration between government agencies responsible for land-use, development, agricultural and environmental planning and education as well as other stakeholders responsible for disaster management.

National Disaster Management Plan

The Disaster Management Act, 2005 (DM Act 2005) lays down institutional and coordination mechanism for effective Disaster Management (DM) at the national, state, district and local levels. As mandated by this Act, the Government of India (GoI) created a multi-tiered institutional system consisting of the National Disaster Management Authority (NDMA) headed by the Prime Minister, the State Disaster Management Authorities (SDMAs) headed by the respective Chief Ministers and the District Disaster Management Authorities (DDMAs) headed by the District Collectors and co-chaired by Chairpersons of the local bodies. These bodies have been set up to facilitate a paradigm shift from the hitherto relief-centric approach to a more proactive, holistic and integrated approach of strengthening disaster preparedness, mitigation, and emergency response (Figure 33.2).

The NDMP is envisaged as ready for activation at all times in response to an emergency in any part of the country. It is designed in such a way that it can be implemented as needed on a flexible and scalable manner in all phases of disaster management: a) mitigation (prevention and risk reduction), b) preparedness, c) response and d) recovery (immediate restoration to build-back better).

Figure 33.2: Institutional Framework for disaster management in India


National Disaster Management Institutional Mechanism
Designated Nodal Ministries (Disaster-Specific)
Top Level Decision Making
National Disaster Management Authority (NDMA)
National Executive Committee (NEC)

The NDMP is consistent with the approaches promoted globally by the United Nations, in particular the Sendai Framework for Disaster Risk Reduction 2015-2030. India will make all efforts to contribute to the realization of the global targets by improving the entire disaster management cycle in India by following the recommendations in the Sendai Framework and by adopting globally accepted best practices. The four priorities for action under the Sendai Framework are:

1. Understanding disaster risk
2. Strengthening disaster risk governance to manage disaster risk
3. Investing in disaster risk reduction for resilience
4. Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

The NDMP incorporates substantively the approach enunciated in the Sendai Framework and will help the country to meet the goals set in the framework. By 2030, the Sendai Framework aims to achieve substantial reduction of disaster risk and losses in lives, livelihoods, and health and in the economic, physical, social, cultural, and environmental assets of persons, businesses, communities, and countries. The NDMP has been aligned broadly with the goals and priorities set out in the Sendai Framework for DRR. While the four cross-cutting Sendai priorities will be present explicitly or

Vision

Make India disaster resilient, achieve substantial disaster risk reduction, and significantly decrease the losses of life, livelihoods, and assets – economic, physical, social, cultural, and environmental – by maximizing the ability to cope with disasters at all levels of administration as well as among communities.

Objectives

The broad objectives of the NDMP are:

1) Improve the understanding of disaster risk, hazards, and vulnerabilities
2) Strengthen disaster risk governance at all levels from local to centre
3) Invest in disaster risk reduction for resilience through structural, non-structural and financial measures, as well as comprehensive capacity development
4) Enhance disaster preparedness for effective response
5) Promote "Build Back Better" in recovery, rehabilitation and reconstruction
6) Prevent disasters and achieve substantial reduction of disaster risk and losses in lives, livelihoods, health, and assets (economic, physical, social, cultural and environmental)
7) Increase resilience and prevent the emergence of new disaster risks and reduce the existing
Risks
8) Promote the implementation of integrated and inclusive economic, structural, legal, social, health, cultural, educational, environmental, technological, political and institutional measures to prevent and reduce hazard exposure and vulnerabilities to disaster
9) Empower both local authorities and communities as partners to reduce and manage disaster risks
10) Strengthen scientific and technical capabilities in all aspects of disaster management
11) Capacity development at all levels to effectively respond to multiple hazards and for community-based disaster management
12) Provide clarity on roles and responsibilities of various Ministries and Departments involved in different aspects of disaster management
13) Promote the culture of disaster risk prevention and mitigation at all levels
14) Facilitate the mainstreaming of disaster management concerns into the developmental planning and processes

Multi-Hazard Vulnerability

India, due to its, physiographic and climatic conditions is one of the most disaster prone areas of the world (Figure 33.1). Vulnerability to disasters/emergencies of Chemical, Biological, Radiological and Nuclear (CBRN) origin also exists. Heightened vulnerabilities to disaster risks can be related to increasing population, urbanisation, industrialisation, development within high-risk zones, environmental degradation, and climate change. The DM Act of 2005 and DM Policy of 2009 consider disasters to be natural or human-induced for defining the roles and responsibilities. The human-induced category includes CBRN disasters. Besides, with the natural factors discussed earlier, various humaninduced activities are also responsible for accelerated impact and increase in frequency of disasters in the country. The NDMP covers disaster management cycle for all types of hazards faced in India –both natural and human-induced.

Reducing Risk; Enhancing Resilience

Disaster risk reduction is a cross-sectoral issue. The concerted efforts of integrating it into development activities require consensus and active participation of decision makers and planners at national, state and panchayat/local bodies levels.

The role of the central agencies is to support the disaster-affected State or the UT in response to requests for assistance. However, the central agencies will play a pro-active role in disaster situations. In the domains of DM planning, preparedness, and capacity building, the central agencies will constantly work to upgrade Indian DM systems and practices as per global trends. The planning framework has arranged the actions envisaged for risk reduction under five thematic areas for action with one of the four priorities for action of Sendai Framework as its dominant feature. For each hazard, the approach used in this national plan incorporates the four priorities enunciated in the Sendai Framework into the planning framework for Disaster Risk Reduction under the five Thematic Areas for Action:

1. Understanding Risk
2. Inter-Agency Coordination
3. Investing in DRR – Structural Measures
4. Investing in DRR – Non-Structural Measures
5. Capacity Development

For each thematic area for action, the NDMP has identified a set of major themes for undertaking actions within the broad planning framework. The activities envisaged in the NDMP and the Sendai Framework fall into short/ immediate (within 5 years), medium (within 10 years), and long-term (within 15 years) categories, which will be implemented in many instances concurrently, and not necessarily sequentially. For both implementation and the realization of outcomes, they correspond to widely differing scope

in terms of geographic spread, institutional complexity, and time scales. Some of the actions under immediate response are short-lived, while many of the measures for risk reduction and strengthening resilience are long term, which become part of all facets of developmental process through mainstreaming.

In the disaster management cycle in Pre-disaster pase there is a need to work for Prevention and risk reduction and preparedness (Figure 33.3). This has minimized the damage, losses and trauma to the people on one hand and reduce the cost of relief, rehabilitation and reconstruction (Figure 33.4).

Preparedness Plan is spell out in which each and every action is carried out in different phases of disaster: a) Pre-disaster Phase, b) During Disaster Phase, c) Post-disaster Phase. WHO recommended the emergency assessment priority related to the type of emergency should be carried out:

Sudden Impact Emergencies	*Gradual Onset Emergencies*
* Ongoing hazards	* Mortality rates
* Injuries and deaths	* Nutritional rates
* Shelter requirement	* Immunization status
* Potable water	* Environmental health

Response

Postdisaster Phase is very crucial for saving lives and preventing damages. For effective management of health problems it is divided in five phases (Table 33.1).

Health Implication

1. Direct: Death, Injuries,
2. Indirect: Communicable Diseases,
3. Management: Strain on disrupted infrastructure, disruption of national programs

Response measures are those taken immediately after receiving early warning, anticipating an impending disaster, or post-disaster in cases where an event

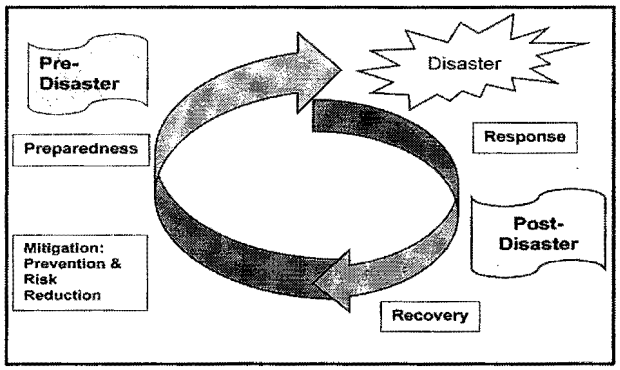


Figure 33.3: Disaster Management Cycle

Figure 33.4: The effects of disasters on the development of prepared and unprepared community

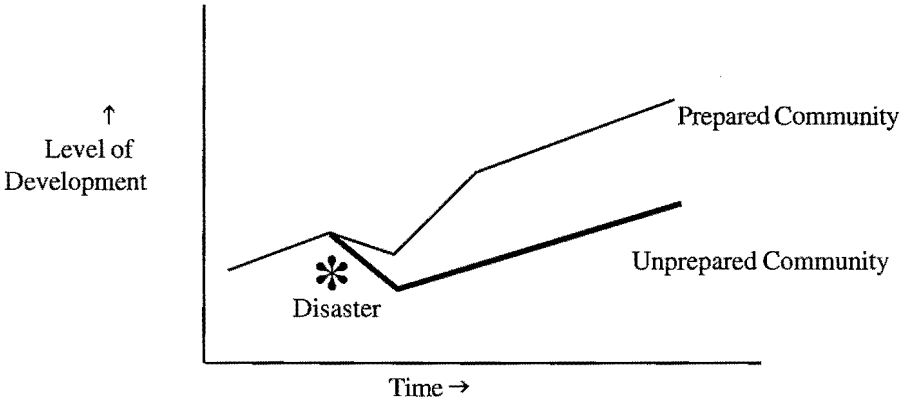


Table: 33.1: Phases after disaster and associated health problems

Phase	*Days*	*Likely health problem*
I	0-3 Days	Disposal of dead bodies, injuries, drowning, snakebites,
II	4-10 Days	Cholera, Bacterial dysentery,
III	11 Days-3 Weeks	Pneumonia, hepatitis, meningitis, polio, measles,
IV	3-6 Weeks	Malaria, dengue, JE, plague, rehabilitation of injuries,
V	> 6 weeks	Psychological Problems, Malnutrition, etc.

occurs without warning. The primary goal of response to a disaster is saving lives, protecting property, environment, and meeting basic needs of human and other living beings after the disaster. The immediate focus will be on search and rescue of those affected and to evacuate those likely to be affected by the disaster or secondary disaster that is likely to happen. The plan has fixed the responsibility to each functionary at all levels.

At the national level, the central government has assigned nodal responsibilities to specific ministries for coordinating disaster-specific responses (Table 33.2). The NDMA will be coordinating with relevant nodal ministry. The disaster-specific nodal ministry will ensure liaison with the state government where the disaster has occurred and coordination among various relevant ministries and departments to provide quick and efficient response. The state government will activate the Incident Response Teams (IRT) at state, district, or the block level as required. The IRTs will coordinate with the state EOC. The SDMA1 (or its equivalent, CoR, or Dept. of Revenue) will provide technical support to the response.

Different central ministries and departments will provide emergency support to the response effort as per request from the State Government. It may be noted that the SDMA, Department of Revenue or Commissioner of Relief (as applicable) is the nodal agency for coordination of disaster response.

Table 33.2: Nodal ministries for management of different disaster

	Disaster	Nodal Ministry/ Dept./ Agency	
1	Biological Disasters	Min. of Health and Family Welfare	(MoHFW)
2	Chemical Disasters and Industrial Accidents	Min. of Environment, Forests and Climate Change	(MoEFCC)
3	Civil Aviation Accidents	Min. of Civil Aviation	(MoCA)
4	Cyclone, Tornado, and Tsunami	Min. of Home Affairs	(MHA)
5	Disasters in Mines	Min. of Coal; Min. of Mines	(MoC, MoM)
6	Drought, Hailstorm, Cold Wave and Frost, Pest Attack	Min. of Agriculture and Farmers Welfare	(MoAFW)
7	Earthquake	Min. of Home Affairs	(MHA)
8	Flood	Min. of Home Affairs	(MHA)
9	Forest Fire	Min. of Environment, Forests and Climate Change	(MoEFCC)
10	Landslides and Avalanche	Min. of Home Affairs	(MHA)
11	Nuclear and Radiological Emergencies	Dept. of Atomic Energy, Min. of Home Affairs	(DAE,MHA)
12	Oil Spills	Min. of Defence/Indian Coast Guard	(MoD/ICG)
13	Rail Accidents	Min. of Railways	(MoR)
14	Road Accidents	Min. of Road Transport and Highways	(MoRTH)
15	Urban Floods	Min. of Urban Development	(MoUD)

The various agencies whose responsibilities are defined in detailed DM plans for the state and district will be responsible specific response measures. The DDMA is the nodal agency for coordination of response at district level supported by other district level agencies. The department wise specific activities at central ministries and state government are summarised in matrix providing clarity to the roles and responsibilities of various agencies.

Recovery and Building Back Better (BBB)

Globally, the approach towards post-disaster restoration and rehabilitation has shifted to one of betterment reconstruction. While disasters result in considerable disruption of normal life, enormous suffering, loss of lives and property, global efforts consider the recovery, rehabilitation and reconstruction phase as an opportunity to build back better integrating disaster risk reduction into development measures, and making communities resilient to disasters. BBB is not limited to the built environment and has a wide applicability encompassing the economy, societal systems, institutions, and environment. The Sendai Framework envisages that the stakeholders will be prepared for BBB after a disaster. Existing mechanisms may require strengthening in order to provide effective support and achieve better implementation. Disaster recovery tends to be very difficult and long-drawn out. The reconstruction will vary depending on the actual disaster, location, pre-disaster conditions, and the potentialities that emerge at that point of time. The NDMP provides a generalized framework for recovery since it is not possible to anticipate all the possible elements of betterment reconstruction.

Capacity Development

Capacity development covers strengthening of institutions, mechanisms, and capacities of all stakeholders at all levels. The plan recognizes the need for a strategic approach to capacity development and the need for enthusiastic participation of various stakeholders to make it effective.

The plan addresses the challenge of putting in place appropriate institutional framework, management

systems and allocation of resources for efficient prevention and handling of disasters.

The planning needs of capacity development are described for all the four aspects of disaster management:

a) Prevention or mitigation to reduce risk from hazards
b) Preparedness for response
c) Effective response when disaster occurs
d) Ability to recover and build back better

Financial Arrangements

The financing of disaster relief has been an important aspect of federal fiscal relations. The primary responsibility for undertaking rescue, relief, and rehabilitation measures during a disaster lies with the State Governments. The Union Government supplements their efforts through logistic and financial support. The DM Act 2005 provides the legal framework for disaster management and all related matters, including the financial aspects. The Act envisages the constitution of two types of funds: response and mitigation, which are to be set up at the national, state and district levels. Thus, for disaster response, the Act envisages a National Disaster Response Fund, a State Disaster Response Fund in each State and, within the States, a District Disaster Response Fund in each district. Similarly, the Act envisages a National Disaster Mitigation Fund, State Disaster Mitigation Fund and District Disaster Mitigation Fund for disaster mitigation. Section 47 of the DM Act 2005, pertaining to setting up of the National Disaster Mitigation Fund, has not been notified by the Government so far. The financing of the entire disaster management cycle will be as per norms set by the Government of India. The disaster risk reduction will be achieved by mainstreaming the requirements into the developmental plans.

Medical Preparedness for Mass Causalities Management

1. Aims and Objective of the Program: To build infrastructure required for medical preparedness and emergency medical response across the country to manage the mass casualties efficiently and to decrease morbidity and mortality.
2. Component-wise activities indicating structural and non structural measures (e.g. Infrastructure, Equipment and Stores, Capacity Building, etc.):
   a) Creation of ambulances services: There is no concept of ambulance services in our country for evacuation of victims from disaster site to hospital. Presently, ambulances are available for transportation of patients within the hospital only. Therefore, there is need to develop dedicated system for making ambulances available 24 hours on a telephonic call. CATS, Delhi, and EMRI, Hyderabad, have started such kind of system. Provision of heli-ambulances need to be made for air evacuation.
   b) Creation of special infrastructure for NBC causalities: Facilities for NBC agents detection equipment, personal protection equipment and decontamination material along with antidotes are required to be created. Designated Hospitals also need to have a Radiation Injury Treatment Centre, Poison Control Centre, Burn Centre & Biosafety Lab. Financial powers need to be delegated to the Medical Superintendents of the Hospitals to buy emergency medical stores.
   c) Trauma Centers: Major Cities in each State and all Metros should have Trauma Centers with 200 beds capacity. Other major Hospitals should have 50-100 Trauma beds in Orthopaedic Departments.
   d) Enhancement of Trained Manpower: Medical and Paramedical staff in Primary Health Centers & Government Hospitals are grossly inadequate. There is an urgent need to fill the vacancies and to create more human resources through public-private partnership. Medical resources of private medical centers are required to be pooled for purpose of disaster management. An understanding in the form of an MOU at all levels, covering the financial compensation to the private medical centers need to be explored.
   e) Training: Regular training of Doctors and Paramedical Staff with structured syllabus should be carried out as CME.
3. All States/UTs involved.
4. The requirement of funds during the XIth Five Year Plan is estimated to be Rs. 10,000 crore. The allocation proposed for the year 2007-08 is Rs. 10 crore.

Emergency Medical Relief (EMR)

The EMR Division under the DGHS is a technical wing for the management of crisis situations. The

Director (EMR) head the division who coordinate with the States level DHS, Store divisions under Central government, vaccine producing units, National Institute of Communicable Diseases, and Director Malaria Unit. The CMO/DMHO act as a District Disaster Relief Officer should prepared a Plan Manual for District with the help of MS/DHO to cover both medical and public health relief.

A detailed guideline from EMR separately for flood, drought, cyclone and earthquakes has been prepared and circulated in the month of March and April to all the drought prone areas and during pre-monsoon period i.e., May and June to the flood and cyclone prone areas. The telephone numbers and other relevant information of the concerned officers at the state level are regularly updated.

During disaster, the Director (EMR) contacts the Control Room and the officer concerned at the state level either by telephone, telex, or wireless system (Police Control Room) between 10 and 12 Noon and get a feed back on:

a) The extend of disaster situation on a particular day;
b) Population affected; and
c) Health profile like number of patients, type of patients or any problem that need proper handling.

Hospital Disaster Action Plan

1. Initial Alert: information receiving person in casualty ask for detail of disaster and inform higher CMO/MS.
2. Activating Hospital Disaster Plan for medical relief as soon as information reached in which investigating and diagnostic services become alert. Transfer and discharging minor cases from hospital and expansion of wards are carried out.
3. Formulation of command nucleus with specifying roles of each of them.
4. Checking of manpower, equipments and drugs.
5. Clinical management of services: **Triage** means allotment of priority for treatment and evaluation of casualties, i.e. sorting out/ pick out cases or classifying cases - Priority I (Critical and severely ill), Priority II (Moderately ill requiring possible resuscitation and/ or early surgery within the next 24 hours) and Priority III (minor cases or moribund cases under irreversible shock or no hope of survival). Triage can be done in casualty ward or operation theater or radiology department.
6. Management of life supporting services and specific problems.
7. Administrative problems-handling police, relatives, media, patient property, voluntary organization or workers, disposal of death, ambulance, etc.

The disease surveillance is undertaken by the surveillance unit of each state and coordinates at the central level by the *National Center for Disease Control*, New Delhi. *Central Medical Stores* at Karnal, Mumbai, Chennai, Hyderabad, Kolkata and Guwahati are kept in readiness to provide logistical support for the dispatch of essential drugs and other medical supplies. *Central Research Institute*, Kasauli was also kept on alert to supply vaccines. Vaccines such as Anti-snake venom and Anti-Rabies are supplied to the State Government usually on credit basis.

The new emergency health kit 1998: An Emergency health kit weighs 860 Kg and occupy 4 m^3 consists of drugs and medical supplies can be used to satisfy the basic medical needs of 10,000 people for approximately 3 months (WHO 1999).

National Institute of Disaster Management

A **National Centre for Disaster Management (NCDM)** was set up by the Ministry of Home in the Indian Institute of Public Administration in 1995. The Centre **was upgraded as National Institute of Disaster Management (NIDM) in 2003.** The Institute got the status of a statutory organization under the Disaster Management Act, 2005.

The Institute is the apex body for training, capacity building, research, documentation and networking on various aspects of disaster risk reduction and management. The Institute is collaborating with 47 National level and 29 State level Institutes. The Institute has recently hosted the SAARC Disaster Management Centre in its premises.

However, the Institute is very poorly equipped in terms of basic infrastructure facilities. The required space for state-of-the-art Emergency Operations Centre, Disaster Mitigation Workshop, Mock Drill Exercise, Library, GIS Laboratory, etc., is not available.

Therefore, it is extremely important that the Institute is equipped with all these facilities so that it is able to discharges its responsibilities properly.

Indian Disaster Reduction Network: Initiated by MHA & UNDP.

- A **nationwide electronic inventory** - essential and specialist resources for disaster response.
- **IDRN lists** :
  - The equipment - by type and by its functions.
  - Gives the contact details of the controlling officers in-charge.
- **Users and partners of IDRN**
  - District administrations,
  - State/ UT administrations
  - Corporate bodies with CII
  - Indian Railways and public sector undertaking in the country
  - Builders contractors and construction companies with BAI

MANAGEMENT PLAN FOR FLOOD AFFECTED AREAS, AN EXAMPLE

List of common ailments/diseases usually occur during and after floods

1. Drowning
2. Injuries and snake bites
3. Respiratory diseases
4. Diarrheal diseases like cholera, dysentery, hepatitis, and poliomyelitis
5. Malaria or filaria
6. Skin diseases
7. Eyes infections
8. Psychological disorders

Preventive Measures

1. Provision of safe drinking water: Safety of drinking water can be ensured either at the point of storage or distribution. Prescribing boiling of water or use of chlorine tablets for chlorination at household level is one of the most important preventable steps. Chlorinometer is used to measures chlorine content in water regularly.
2. Disposal of waste and human excreta needs special attention.
3. Fly proofing is done by regular bleaching powder spray in the areas.
4. Health education: Use of mass media like radio, TV, Newspapers, pamphlets, leaflets containing small repeated message on:
   a) Personal hygiene
   b) Water consumption
   c) Use of boiled water and use of chlorine tablets
   d) Food consumption: Food should be safe, fresh and less costly.
5. Surveillance: a close watch should be kept every day on disease occurrence and trends should be instituted.
6. Immunization against diseases for high risk group population.
7. Preparedness for occurrence of disease epidemic.
8. Administrative arrangements need to be ensured:
   a) Identification of target groups/communities.
   b) Procurement from medical stores: It is expected that 10% of the affected population may require medical treatment. Most common diseases are diarrheal diseases including gastroenteritis, dysenteries, cholera, typhoid, infective hepatitis and poliomyelitis, respiratory infections, skin infections, malaria, insect bites, and snakebites.
   c) Disinfection of drinking water sources and frequent monitoring at distribution point like houses.
   d) Immunization.
   e) Establishment of medical and health camps.
   f) Setting up of epidemiological surveillance.
   g) Publicity and health education.
   h) Involvement of other departments for handling veterinary problems, transport problems, water and sanitation problems, etc.
   i) More Involvement of community groups, NGOs and other voluntary groups in relief activities.
   j) Monitoring and review.

Role of Indian Red Cross Society

The society was constituted under the Indian Red Cross Society Act. It provides following services in case of emergency whether it is war, or disaster:

1. Food and other necessary supplies,
2. Medicines,
3. Blood supply for emergency operations,
4. Psychological support,
5. Tracing,
6. Warehousing,

7. Communication,
8. Others such as supportive services, etc.

Centrally Sponsored Scheme for the Accidents and Emergency Services

Central government has started a scheme with the aim of augment the accident and emergency center in cities and on national highways to mitigate any disaster arise due to road or train accidents, etc.

The grant-in-aid

- Purchase of well equipped ambulance and basic essential equipment required for accident and trauma services;
- Communication system;
- Infrastructure (blood bank, examination room, resuscitation, ICU, Burn beds, X-rays room, reception, control, minor OT); and
- Beds and equipment.

BIOTERRORISM

HISTORY

A use of violence and threat of violence, especially for political purpose is can be called as terrorism. Bioterrorism (Biological warfare) has been defined as "the deliberate release of disease-causing germs with the intent of killing large numbers of people — and of panicking many more". For the bulk production of biological weapon, an advance technology and support of a nation or state is necessary. Biological weapons (plant and animal species that can cause dreaded diseases used as the weapons) are the real threat to the public health of any country in the world and none seems prepared. In history, biological agents such as the plague infected human or animal bodies, elephants, live snakes, poisoning water supply, and many other organisms have been used in warfare (Gerssler & Van Courtland 1999). The German used microorganism as a warfare agent by inoculating domestic animals that were sent to the United States, with anthrax and glanders (*Pseudomon pseudomallei*) during World War I. The Japanese used plague infected fleas and other biological agents on agents on China cities and prisoners (Harris 1992). In Second World War biological weapons were widely used by Japan, US, Britain, German, and other countries.

The threat of biological warfare has always been perceived by the Indian defense and medical experts for a long time. During the Indo-Pakistan war of 1965, a scrub typhus outbreak in northeastern India came under suspicion. India's defense and intelligence outfits were alert to the outbreak of pneumonic plague—well known in biological warfare—in Surat, Gujarat and bubonic plague in Beed, Maharashtra in 1994, which caused several deaths and sizeable economic loss. There are "suspicious" outbreaks, such as a 1996 outbreak of dengue in Delhi (10252 cases; 423 deaths), and the outbreak of unidentified encephalitis in Siliguri, eastern India, in February 2001 (66 cases; 45 deaths). Both outbreaks have baffled Indian researchers (Sharma 2001).

BIOLOGICAL WEAPONS

Many microorganisms are in the list of potential biological weapons. These microorganisms can be classified (Table 33.2) according to the different modes of transmission. Some of these germs - like smallpox, plague, and cholera - could set off worldwide epidemics. Others, like anthrax, aren't spread from person-to-person, but still can be made extremely deadly by putting them in an ultra-fine powder and spraying it over a wide area. Very small amounts can kill millions. Few milliliters of Cholera broth can be mixed with drinking water tank or supply system to infect large number of people at a time. Any thing can be adulterated with infected organisms if these organisms can survive in that medium for sometime. The target populations are likely to be big metropolitan cities, military camps, big urban conglomeration, refugee camps, and districts having international borders. However, no part of the country can be considered immune to such attacks. Concern regarding the use of biological agents (bacteria, viruses, or toxins) as tools of warfare or terrorism has led to measures to deter their use or, failing that, to deal with the consequences. Unlike chemical agents, which typically lead to severe disease syndromes within minutes at the site of exposure, diseases resulting from biological agents have incubation periods of days. Rather than a police or paramedic, it will likely be a physician who is first faced with evidence of the results of a biological attack. Exposed persons would report to the physician first when they are going to have signs and symptoms of disease. If the cause is identified quickly, appropriate therapy can be initiated and the impact of a terrorist attack greatly reduced.

Table 33.2: List of micro-organisms according to the modes of transmission

Mode of Transmission	Micro-organisms/toxins
A. Air: droplet, dusts	Smallpox, Plague, C. botulinum, Francisella tularensis, Legionella, Hemorrhagic fever, Anthrax, Influenza virus, Coccidiodomycosis (fungus), Coxiella burnetii (Q fever),
B. Food: fruits, vegetables, Plants and seaweeds	Salmonella, Shigella, E.coli 0157:H7, Bordetella, Hepatitis A, Clostridium botulinum and perfringens, Seaweed toxins
C. Drinking water	Cholera and other enteric pathogens, Hepatitis A & E,
D. Fomites	Anthrax, Acute enteric infections,
E. Biological vector, Snakes and spiders	Yellow fever, Dengue hemorrhagic fever, Ebola, Marburg virus, Rickettsia, Snake and Spiders toxins

Countermeasures

Despite the international agreements to ban such weapons, namely the 1925 Geneva Protocol and the 1975 Biological and Toxin Weapons Convention, there is no effective international mechanism for challenging either the development of biological weapons or their use. Neither an effective surveillance nor mitigation system is available for biological warfare even in most advanced countries like the United States (Rosen 2000). There is a need for proper planning, good communication between various departments like health, home office, defense and intelligence agencies and sufficient financial support for a realistic state of preparedness in every country.

The Ministry of Health has produced guidelines for responding to real or suspected incidents and the NICD has produced detailed protocols to inform the actions required by microbiologists and epidemiologist in communicable disease control. The following key countermeasures against bioterrorism have been suggested by NICD:

1. *Prevention:* all efforts should be made to reduce the aggression among various groups and countries. More cooperation and collaboration is required to enhance peace and harmony within the country and cross border areas.
2. *Deterrence:* terrorist must be identify and prevented from conducting any illegal activity and must be punished without delay.
3. *Strengthening Epidemiological Surveillance:* There is a need to develop surveillance for microorganisms that can be used in bio-terrorism. Under the National Disease Surveillance Program and Integrated Disease Surveillance Project more districts and states must be covered and existing system should be strengthened to tackle the problem. That should be linked with well established laboratories located in appropriate institutions and regions. Rapid testing of samples would be helpful in early containment of disease epidemic. Public health system need to be sensitized to capture the information and transmit it to the appropriate authority at district and state level if one get epidemiological clues of a biological warfare or terrorist attack. Any other suspicious mode of transmission, clinical presentation, patterns of spread or occurrence in the population should be subjected to epidemiological investigation.
4. *Medical Management:* Bio-terrorist attacks may occur without warning that is why emergencies, primary care clinics, local public health agencies, should be strengthened by training and by providing adequate infrastructure for appropriate management.
5. *Information, Education and Communication:* Terror affects social well-being and psychological health of the individual and of the community. Lot of effective counseling and dissemination of right information required before and after the attack.
6. *Capacity building:* Developing experts in bio-terrorism is also necessary. Epidemiologists, local health officers, primary care physician, emergencists, nurses, and laboratory workers need to be trained in various aspect of bio-terrorism.

The time has come when all countries and groups should sit together to formulate global strategy to handle regional and religious conflicts and mass poverty. There is a need of universal codes of conduct that should be above all religious sentiments. Sincere efforts should be made to bridge gaps among groups and countries in terms of resources, opportunities, etc. This is the most urgent task in the world that needs to be completed as soon as possible to save human civilization (Kishore 2001).

ANTHRAX

An Example of Bioterrorism Agent

Anthrax is a zoonotic disease caused by bacterium *Bacillus anthracis*. The spores of anthrax can survive in the environment for a long time. People can catch anthrax from infected animals or contaminated animal products. Most natural infection comes from skin contact. The disease is acquired by butchering, skinning, or dissecting infected carcass or by handling contaminated hides, wools, hair, or other material and common in workers dealing with these materials. One can also get anthrax infection from eating raw or too-rare meat - but this is uncommon. Even more uncommon - but by far most deadly - is anthrax caught by inhaling spores.

Anthrax has been called the perfect germ for bio-terrorism. This is because it isn't contagious - only those exposed to a release of spores get sick - so there's no chance that a release of the germs will boomerang and kill unintended victims. The spores last for a long time in the soil. During World War II, the British army experimented with an explosive shell filled with anthrax spores. These experiments took place on an island off the coast of Scotland. Spores persisted in the environment for 36 years. The economic impact of a bio-terrorist attack is as high as $26.2 billion per 100,000 persons exposed to anthrax (Kaufmann et al 1997). One hundred kilogram of anthrax can kill 1-3 million people, more than the damage caused by one megaton of nuclear bomb (Spencer & Lightfoot 2001).

When anthrax spores get inside the body, they grow rapidly. The bacteria themselves can cause dangerous infections. Far more dangerous is a substance they produce in the body - anthrax toxin – that kills off cells of the immune system. The symptoms of anthrax infection depend on how a person catches the disease. All forms of anthrax if diagnosed early enough can be cured by prompt antibiotic treatment.

Clinical Skin infection starts with an itchy bump like a mosquito bite. After a day or two, it forms a small liquid-filled sac. This sac then becomes a painless ulcer with an area of black, dead tissue in the middle. Antibiotic treatment cures this infection. Untreated anthrax kills about one in five people. The signs of *intestinal infection* are nausea, loss of appetite, and vomiting. This is followed by severe abdominal pain, vomiting of blood, and severe diarrhea. Untreated intestinal anthrax is deadly 25% to 60% of the time. *Inhalation anthrax*, the most deadly form of the disease, begins with the same symptoms as a common cold. As early as one day after these symptoms appear - but up to weeks later - the symptoms suddenly become much more severe, usually with breathing problems and shock. This form of the disease is often fatal. Fortunately, anthrax does not spread from person to person.

National Center for Diseases Control (NCDC) under the Ministry of Health has proposed to set up surveillance system for major microorganisms including anthrax potential to be used in bioterrorism. Early treatment with penicillin is essential. Other antibiotics are also recommended like doxycycline and ciprofloxacin. Because anthrax spores can stay hidden in the lungs for a long time, antibiotic treatment should continue for 60 days.

Unless one is exposed to anthrax, there's no reason to suspect the disease and start antibiotics. Most people in India are already exposed to anthrax during handling of animals and their products. Recent exposures to anthrax appear to have come from letters and boxes containing powdered anthrax spores, but there's no cause for panic. Postal department has issued an necessary list of instructions to the costumers if they receive any mail that contain powder or stiff or lumpy material, or having strange or foul smell or send by known public figure, or having excessive weight or excessively taped articles or written on the mail "Do not X-rays", "Fragile", "Do not open" or "confidential". Following measures should be adopted if someone received a letter or package that he/she suspects of containing anthrax or any other dangerous germs:

- Do not shake or empty the envelope or package. Do not try to clean up any spilled powder or fluid.

Switch off fans/ coolers/ air-conditioners/ blowers immediately.

- Put the envelope or package into a plastic bag or other container to prevent the contents from leaking out. If you can't find a container, cover the envelope or package with clothing, paper, or a trash can — and don't remove this cover.
- Leave the room and close the door. Keep away other people from entering the room.
- Wash your hands with soap and water.
- Call the local police and report the incident. If you are at work, call your building security officer and/ or your supervisor.
- Make a list of all the people who were in the room when you opened the letter or package. Give this list to the police — and to local public-health authorities.
- Remove contaminated clothing and put it into a plastic bag that can be sealed. Give the bag of contaminated clothing to the police.
- Shower with soap and water as soon as you can. Do not use bleach or disinfectant on your skin.
- Do not start taking antibiotics until told to do so by your doctor or by health authorities.
- Gas masks or respirators won't do much good once an exposure has taken place.
- Anthrax vaccine - a series of six shots over the course of a year with yearly booster shots - is not recommended for or available to the public. However, it should be made available for occupational groups, animal handlers, veterinary physician, laboratory workers, etc.

SEVERE ACUTE RESPIRATORY SYNDROME (SARS)

BURDEN

SARS has emerged from southern China in Nov. 2002 but first time reported in Hanoi in Vietnam on 26th Feb 2003. On 5th March 2003, 5 Health Care Workers who attended the patient fall sick. In a short span of time it spread to 29 countries in the world due to rapid international travel. Chinese called it "That" disease means an atypical pneumonia. Tourism had got severe setback and economy fell in affected region.

EPIDEMIOLOGY OF SARS

The causative agent of SARS is Corona Virus (enveloped RNA virus-SARS CoV). Epidemiological data indicate that the virus is largely spread by direct or indirect contact with respiratory droplets, airborne transmission has also been reported. Its incubation period is 2-14 days with the viral load peaking during the second week of illness and appearing to be highest in patients with more severe disease. It is transmitted through person to person contact in droplets or body fluids. Case Fatality Rate is 0% to 50% (Average 15%).

Clinical Features

Suspected Case

- Sudden onset of high grade fever;
- Cough or breathing difficulty;
- One or more of the following exposures during the 10 days prior to onset of symptoms:
  - History of visit to or residing in a SARS Affected Area
  - History of having cared for, having lived with, having had face to face contact with or having had contact with respiratory secretions or body fluids of a suspected or probable case of SARS.

Probable Case

- A suspect case having X-rays findings of pneumonia, OR
- A suspect case with autopsy findings consistent with the pathology of RDS without an identifiable causes, OR
- A suspect case of SARS that is positive for SARS Coronavirus by one or more assays in a laboratory using appropriate quality control procedure.

Laboratory Tests of SARS

- Molecular Test (PCR)
- Cell Culture
- Antibodies Detection Tests-ELISA, Immunofluorescence Assays (IFA), Neutralization Test.
- These tests are not recommended on asymptomatic case.

These tests are performed in followed institutions approved by the central government. All samples can be sent to these institutions:

- National Institute of Virology, Pune.
- NICD Delhi

- TRC Chennai
- National Institute of Cholera & Enteric Diseases
- National AIDS Research Institute (NARI).

Guidelines for Personal Protective Equipment

- Face masks are recommended in:
  - Surveillance settings (triple layered face mask in airports/sea ports);
  - Casualty/Triage Area/Inpatients settings (P100 or P 99 filter level face mask)
  - Critical care setting: during intubations, artificial ventilation and endotracheal suctioning
- Hand washing is effective in control spread of infection.
- Physical Space separation: increasing physical space in between the patients and reduction of hospital visitors control the spread.

Management

- Good supportive treatment is life saving.
- Ribavarin and Steroid are useful for critical patients. Recently, cinanserin is used successfully to treat the SARS disease.

Prevention & Control of SARS

- Isolation of suspect and probable cases;
- Universal Precaution and using Personal Protective Equipment;
- Screening for possible SARS at the time of departure in international travel;
- Screening of all passengers and crew coming to the international airports and ports by Medical Officers;
- Proper management of suspect or probable case;
- International health regulation demands general declaration of any illness on board;
- Hospital visits or exposure to crowded places should be avoided until urgently required;
- Prompt response by the people to the alarming symptoms;
- IEC through mass media to mitigate panics; and
- Coordination with International agencies.
- Environmental Decontamination: all body fluids contains SARS virus and survive up to 72 hours. The cleaning and disinfection of environmental surfaces in believed to be effective against SARS CoV.
- Education and training: All health care workers should be trained in universal precaution and infection control guidelines.
- Psychological and social support: Once the disease strike to any community there is epidemic of anxiety and stress. Fear of infection, financial loss, stigmatization, change to personal and family life, refusal of care, etc. are various concerns and must be handled promptly by the local and national bodies.

HUMAN INFLUENZA TYPE A H1N1 (SWINE FLU)

EPIDEMIOLOGY

The 2009 flu outbreak in humans, known as "swine flu", is due to a new strain of influenza A virus subtype H1N1 that contained genes most closely related to swine influenza. The influenza virus has characteristics of antigenic variation due to antigenic shift and drift. Swine act as reassorted vessel in which various viruses can mixed together and new type of virus emerged such as H1N1 which is a outcome of mixing of swine flu, american flu and avian flu. The human race does not have immunity against this new reassorted and novel virus that is why it has potential to spread world wide. Few cases of influenza like illnesses reported in Maxico on 18th of March spread to whole of world within two months time. On 22 May 2009 the first case of swine influenza reported from India in Nonresident India. By 11 September 2009 more than 277607 cases and 3205 deaths reported whereas in India alone there were more than 1400 cases and more than 25 deaths.

The rising trend of the cases was observed from the 2nd week of 2015, which continued to peak till 8th week of 2015 and started to decline during week 18. A total of 35,767 cases & 2218 deaths were reported during the spurt from 2nd week to 18th week. Maximum cases were reported during the month of February (Fig. 33.4). The States most affected during the initial spurt (week 2- week 18) were Rajasthan, Gujarat, Maharashtra, Delhi, Karnataka, Telangana & Madhya Pradesh.

Swine influenza virus transmission from pigs to humans is not common but properly cooked pork poses no risk

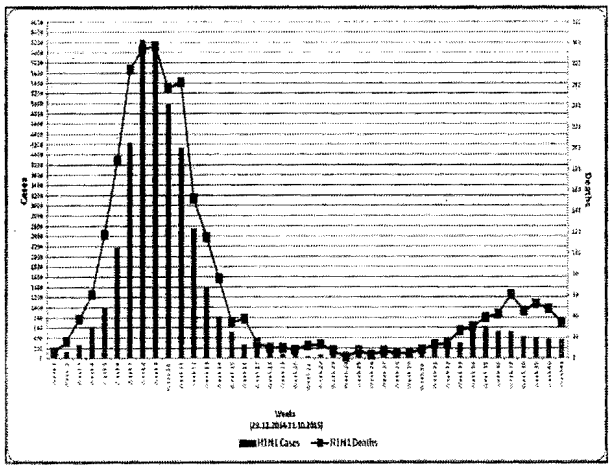


Figure 33.4: Week wise laboratory confirmed cases and deaths of Influenza H1N1 in India

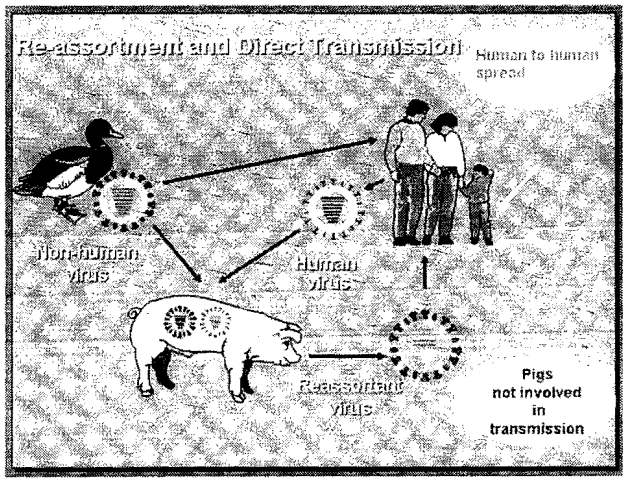


Figure 33.5: Transmission of Influenza H1N1

of infection. When transmitted, the virus does not always cause human influenza and often the only sign of infection is the presence of antibodies in the blood, detectable only by laboratory tests. The main route of transmission is through direct contact between infected and uninfected animals. These close contacts are particularly common during animal transport or during intensive farming in which pigs are raised in very close proximity to each other. The direct transfer of the virus probably occurs either by pigs touching noses, or through dried mucus or kiss. Airborne transmission through the aerosols produced by pigs coughing or sneezing are also an important means of infection. The virus usually spreads quickly through a herd, infecting all the pigs within just a few days. Transmission may also occur through wild animals, such as wild boar, which can spread the disease between farms (Figure 33.5).

Transmission of influenza from swine to humans who work with swine. Other professions at particular risk of infection are veterinarians and meat processing workers, although the risk of infection for both of these groups is lower than that of farm workers.

SIGN AND SYMPTOMS: *In swine:* In pigs influenza infection produces fever, lethargy, sneezing, coughing, difficulty breathing and decreased appetite. In some cases the infection can cause abortion. Although mortality is usually low (around 1-4%), the virus can produce weight loss and poor growth, causing economic loss to farmers.

In humans: The 2009 outbreak has shown an increased percentage of patients reporting diarrhea and vomiting. WHO has given guidelines to define cases as follows:

Suspected case is defined as a person with acute febrile respiratory illness (fever e" 38^0C) with onset: a) within 7 days of close contact with a person who is a confirmed case of swine influenza A (H1N1) virus infection, or b) within 7 days of travel to community where there are one or more confirmed swine influenza A (H1N1) cases, or c) resides in a community where there are one or more confirmed swine influenza cases.

Probable case: defined as a person with an acute febrile respiratory illness who is: a) positive for influenza A, but unsubtypable for H1 by influenza RT-PCR or reagents used to detect seasonal influenza virus infection, or b) positive for influenza A by an influenza rapid test or an influenza immunofluorescence assay (IFA) plus meets criteria for a suspected case c) individual with a clinically compatible illness who died of an unexplained acute respiratory illness who is considered to be epidemiologically linked to a probable or confirmed case.

Confirmed case: defined as a person with: a) An acute febrile respiratory illness with laboratory confirmed swine influenza A (H1N1) virus infection at WHO approved laboratories by one or more of the

following tests: 1. Real Time PCR, 2. Viral culture, 3. Fourfold rise in swine influenza A (H1N1) virus specific neutralizing antibodies.

Guidelines for screening, categorization, and treatment of H1N1 Influenza issues by the Government of India

Category A

- Symptoms: mild fever, cough, sore throat, with and without bodyache, diarrhea, vomiting
- Testing H1N1 Not required
- Treatment: Symptomatic and monitored and reassessed after 24 or 48 hours by doctor
- Isolation

Category B

- Symptoms: High fever, cough, sore throat, bodyache, diarrhea, vomiting
- Testing H1N1 Not required
- Treatment: Symptomatic and monitored conditions but oseltamivir (Tamiflu) is given if child <5 yr, elderly >65 yr, Pregnant, anybody suffering from chronic diseases of lung/heart/liver/kidney/ blood/ diabetes/ neurological/cancers
- Isolation strictly followed

Category C

- Symptoms: High fever, cough, sore throat, body ache, diarrhea, vomiting and also has one or two of the following: Breathlessness, drowsiness, fall in blood pressure, sputum mixed with blood, bluish discoloration of nails, irritability in children, refusal to accept, worsening of underlining conditions
- Testing H1N1 required
- Treatment: Immediate hospitalization and treatment with oseltamivir (Tamiflu)

Clinicians should obtain a nasopharyngeal or throat swab for swine influenza testing and place it in a refrigerator (not a freezer) but transport within 24 hours if not then store at –70 degree C. Once collected, the clinician should contact their state or local health department to facilitate transport and timely diagnosis at a state public health laboratory.

PREVENTION: Prevention of swine influenza has three components: prevention in swine, prevention of transmission to humans, and prevention of its spread among humans.

Prevention in swine : Methods of preventing the spread of influenza among swine include facility management, herd management, and vaccination.

Prevention of pig to human transmission: Swine can be infected by both avian and human influenza strains of influenza, and therefore are hosts where the antigenic shifts can occur that create new influenza strains.

The transmission from swine to human is believed to occur mainly in swine farms where farmers are in close contact with live pigs. Although strains of swine influenza are usually not able to infect humans this may occasionally happen, so farmers and veterinarians are encouraged to use a face mask when dealing with infected animals. The use of vaccines on swine to prevent their infection is a major method of limiting swine to human transmission. Risk factors that may contribute to swine-to-human transmission include smoking and not wearing gloves when working with sick animals.

Prevention of human to human transmission: Influenza spreads between humans through coughing or sneezing and people touching something with the virus on it and then touching their own nose or mouth. Swine flu cannot be spread by pork products, since the virus is not transmitted through food. The swine flu in humans is most contagious during the first five days of the illness although some people, most commonly children, can remain contagious for up to ten days. Diagnosis can be made by sending a specimen, collected during the first five days for analysis.

TREATMENT: ***In swine*** As swine influenza is rarely fatal to pigs, little treatment beyond rest and supportive care is required. Instead veterinary efforts are focused on preventing the spread of the virus throughout the farm, or to other farms. Vaccination and animal management techniques are most important in these efforts. Antibiotics are also used to treat this disease, which although they have no effect against the influenza virus, do help prevent bacterial pneumonia and other secondary infections in influenza-weakened herds.

In humans: If a person becomes sick with swine flu, antiviral drugs can make the illness milder and make the patient feel better faster. They may also prevent serious flu complications. For treatment, antiviral drugs work best if started soon after getting sick (within 2

days of symptoms). Beside antivirals, palliative care, at home or in hospital, focuses on controlling fevers and maintaining fluid balance.

Pharmaceutical Interventions: Viruses so far characterized have been sensitive to oseltamivir & zanamivir; resistant to amantadine and rimantadine. Oseltamivir is given in 75 mg dose twice daily for 5 days. Patients should be managed symptomatically in suspect cases and treatment with Oseltamivir should only be started if there is high probability, in serious conditions or confirmed status of H1N1. This will reduce development of resistance. Aspirin for fever and high dose of corticosteroid should be avoided.

Chemoprophylaxis of Oseltamivir 75 mg once daily for 10 days is given in following: 1. Close contacts of a confirmed case; 2. Health care personnel coming in contact with confirmed case.

NON-PHARMACOLOGICAL MEASURES: They are more effective and long lasting for prevention of influenza. Respiratory etiquette, keeping distance, avoiding hand shake and crowded places, social distancing are very effective methods of prevention.

ACTION TAKEN TO CURB THE PROBLEM

International level: The ongoing outbreak of novel influenza A (H1N1) continues to expand internationally. CDC expects that more cases, more hospitalizations and more deaths from this outbreak will occur over the coming days and weeks.

CDC continues to take aggressive action to respond to an expanding outbreak caused by novel H1N1 flu. CDC recommends that testing and antiviral treatment be prioritized for those with severe respiratory illness and those at highest risk of complications from seasonal influenza. This includes children younger than 5 years old, pregnant women, people with chronic medical conditions and weakened immune systems, and people 65 years and older. In addition, CDC has provided information for the public on what to do if they develop flu-like symptoms.

The World Health Organization (WHO) has raised its pandemic alert level to Phase 6 and declared it as Public Health Emergency of International Concern. All supports are extended to member countries to tackle the pandemic. However there is controversy regarding the declaration of this emergency.

AVIAN INFLUENZA (BIRD FLU)

INTRODUCTION

Avian influenza (AI) is a highly contagious viral disease by avian (bird) influenza (flu) viruses affecting several species of food producing birds (chickens, turkeys, quails, guinea fowl, etc.), as well as pet birds and wild birds. These influenza viruses occur naturally among birds. Wild birds worldwide carry the viruses in their intestines, but usually do not get sick from them.

Infected birds shed influenza virus in their saliva, nasal secretions, and feces. Susceptible birds become infected when they have contact with contaminated secretions or excretions or with surfaces that are contaminated with secretions or excretions from infected birds. Domesticated birds may become infected through direct contact with infected waterfowl or other infected poultry, or through contact with surfaces (such as dirt or cages) or materials (such as water or feed) that have been contaminated with the virus. The disease is of two type: The "low pathogenic" and the "highly pathogenic" form which may cause mortality rate that can reach 90-100% often within 48 hours.

Influenza A (H5N1) virus – also called H5N1 virus – is an influenza A virus subtype that occurs mainly in birds, is highly contagious among birds, and can be deadly to them. H5N1 virus does not usually infect people, but infections with these viruses have occurred in humans. Of the few avian influenza viruses that have crossed the species barrier to infect humans, H5N1 has caused the largest number of detected cases of severe disease and death in humans.

WHO has reported human cases of avian influenza A (H5N1) in Asia, Africa, the Pacific, Europe and the Near East. Indonesia and Vietnam have reported the highest number of H5N1 cases to date. The majority of cases have occurred among children and adults aged less than 40 years old. Mortality was highest in cases aged 10-19 years old. Overall mortality in reported H5N1 cases is approximately 60%.

No one can predict when a pandemic might occur. However, experts from around the world are watching the H5N1 situation in Asia and Europe very closely and are preparing for the possibility that the virus may begin to spread more easily and widely from person to person.

The Department of Animal Husbandry, Dairying & Fisheries (DAHD&F), Ministry of Agriculture has notified avian influenza in seven districts of Assam and one district of West Bengal. The districts – Kamrup, Kamrup Metro, Barpeta, Nalbari, Chirang, Dibrugarh and Bongaigon in Assam, and Malda in West Bengal – are affected partially.

Local authorities are culling birds within the three-km radius of the infected villages. Mopping up and sanitization operations are being carried out by the Animal Husbandry Department.

Bird Flu is of public health concern because:

- H5N1 variants are known to have the unique capacity of jumping the species barrier and cause severe disease, with high mortality, in humans.
- Scientists know that avian and human influenza viruses can exchange genes when a person is simultaneously infected with viruses from both species (i.e. Antigenic shift), giving rise to a completely new subtype of the influenza virus to which few, if any, humans would have natural immunity. When this happens, the conditions for the start of a new influenza pandemic will have been met.
- The existing vaccines, which are developed each year to match presently circulating strains and protect humans during seasonal epidemics, would not be effective against a completely new influenza virus. At least four months would be needed to produce a new vaccine, in significant quantities, capable of conferring protection against a new virus subtype.

EPIDEMIOLOGY

Agent: There are 16 known HA subtypes and 9 known NA subtypes of influenza A viruses which are differed because of changes in certain proteins on the surface of the influenza A virus (hemagglutinin [HA] and neuraminidase [NA] proteins). Among these, H5N1 strain of the influenza type A virus is responsible for the current epidemic. There are only three known A subtypes of influenza viruses (H1N1, H1N2, and H3N2) currently circulating among humans. It is likely that some genetic parts of current human influenza A viruses came from birds originally.

Host: Natural reservoir: Migratory waterfowl – most notably wild ducks. *Susceptible hosts:* All birds, pigs, human beings. Certain individuals such as poultry farm workers, workers involved in killing of infected or exposed birds and health care workers treating the human cases are at a higher risk of being infected as result of their occupation

Transmission: Bird to bird or bird to human:

- The virus is secreted in bird droppings and orally, contaminating dust and soil and can survive for long periods in the environment, especially when temperatures are low. Airborne virus then can spread the disease from bird to bird and from birds to humans especially those associated with the poultry trade, causing infection when the virus is inhaled.
- In addition, contaminated equipment, vehicles, feed, cages or clothing – especially shoes – can carry the virus from farm to farm. The virus can also be carried on the feet and bodies of animals, such as rodents, which act as "mechanical vectors" for spreading the disease. Limited evidence suggests that flies can also act as mechanical vectors.
- To date there is no epidemiological information to suggest that the disease can be transmitted through contaminated food or that products shipped from affected areas have been the source of infection in humans.

Human-to-human transmission:

- Very limited human-to-human transmission of the H5N1 strain was documented in health care workers, family members, poultry workers, and workers involved in culling operations in the 1997 outbreak in Hong Kong.
- There is no evidence, to date, that human to human transmission of the currently circulating H5N1 strain has occurred.

CLINICAL COURSE AND TREATMENT OF HUMAN CASES

- The clinical course of human infection with H5N1 avian influenza is limited to studies of cases in the

1997 Hong Kong outbreak in which patients developed symptoms of fever, sore throat, cough and, in several of the fatal cases, severe respiratory distress secondary to viral pneumonia. Previously healthy adults and children, and some with chronic medical conditions, were affected.

- Tests for diagnosing all influenza strains of animals and humans are rapid and reliable. Many laboratories in the WHO global influenza network have the necessary high-security facilities and reagents for performing these tests as well as considerable experience.
- Two classes of drugs are effective against influenza viruses. These are the M2 inhibitors (amantadine and rimantadine) and the neuraminidase inhibitors (oseltamivir and zanamivir).

Control Measures

In Birds

61 Countries have report H5N1 Avian Influenza in Domestic Poultry/Wildlife 2003-2009. The World Organization for Animal Health (OIE) and in cooperation with the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO) provides policy advice, strategy design and technical assistance for the control and eradication of avian influenza.

Global Strategy

One world one health (OWOH)

A better understanding of the causes of the emergence and spread of infectious diseases of animal origin has been recommended within the context of the "One World One Health" Strategy, developed by the four international technical agencies involved (FAO/OIE/WHO/UNICEF). The Strategy relates to the prevention and control of emerging infectious diseases at the animal/human interface: those with the potential to cause epidemics and pandemics, but also those animal diseases having an impact on food security and poverty, since that is also a public health problem. Achieving this goal will:

- diminish the global threat of a human pandemic
- stabilize poultry production globally;
- enhance regional and international trade in poultry and poultry products;
- improve human and food safety; and
- improve the livelihoods of rural populations.

Prevention and Control of Avian Influenza

1. **Early Detection and Warning /Diagnostic Confirmation**
2. **Transparent Notification**
3. **Rapid Response**

1. Early Detection & Warning

The World Organization for Animal Health (OIE) is actively engaged in improving the capacity of national Veterinary Services' surveillance and information systems. The OIE has adopted new standards for the quality of national Veterinary Services and their disease notification systems and improved its own information system in order to provide early and accurate epidemiological information on a worldwide basis, in particular through its Early Warning System.

Biosecurity

Biosecurity measures (including movement controls, use of natural and artificial boundaries, commercial management and husbandry practices) factor in the establishment and maintenance of the health status of a zone or compartment. Significant effort is focused on developing appropriate recommendations for biosecurity in the context of backyard flocks.

Surveillance

Animal health surveillance is essential for early detection and warning of avian influenza. Surveillance strategies will be impacted by variables such as the poultry species at risk, different biosecurity levels and production systems and the frequency of contacts of domestic poultry with wild birds.

Rapid Confirmation of Suspects

Serological diagnosis of AI should be performed in 2 steps, unless the subtype circulating in a given country is already known. The first step aims at the detection of antibodies to AI virus (Group antigen Type A) by Agar gel immunodiffusion test, Enzyme linked immuno-sorbant assay (ELISA). Positivity to these tests indicates that the birds has encountered an influenza A virus but *no information* on the AI subtype which has caused seroconversion can be deduced. The second step, to be performed on samples that are positive to step 1 identifies the viral subtype causing infection. The hemagglutination inhibition (HI) test is to be used for this purpose. OIE certified reagents should be used for diagnostic purposes.

2. Notification of Outbreaks

Member countries are committed to provide to the OIE all information necessary to minimize the spread and achieve better worldwide control of avian influenza and other important animal diseases. The OIE has in place an effective system for data collection, analysis and dissemination of this critical information to all member countries.

Disease Free Status

There is no official recognition of disease-free status for avian influenza. Countries self-declaring freedom should comply to the Terrestrial Animal Health Code, 2008 and report zero annually if there is no case.

3. Rapid Response

In dealing with avian influenza, a disease that can move quickly through populations of birds irrespective of borders, rapid response is of the essence.

- Contingency Planning
- Zoning & Compartmentalization
- Culling
- Strategic Vaccination
- Decontamination & Disposal
- Wildlife
- Food Safety
- Import/Export Considerations
- Compensation

The following vaccine types are currently available

Inactivated vaccines

- Monovalent including either H5 or H7strains
- Bivalent including H5 and H7 strains
- Both monovalent and bivalent vaccines can contain homologous or heterologous neuraminidase subtype; this depends on the neuraminidase of the circulating virus and on the neuraminidase present in the vaccine.
- Combination vaccines (other antigens): if it is foreseen that a prolonged vaccination program may be required, the use of combination vaccines should be considered.
- Live recombinant vaccines (fowlpox H5): these are efficacious only in chicken species, and then only in day-old chicks as exposure in later life to wild-type fowl pox virus would preclude the use of the vectored vaccine.

OIE guidelines emphasize that prevention and control measures such as surveillance and reporting of findings of Natural Avian Influenza in wild birds and vaccination of domestic poultry should not result in unjustified trade restrictions.

In Human

Several measures can help minimize the global public health risks from large outbreaks:

- Workers involved in the culling of poultry flocks must be protected, by proper clothing and equipment, against infection. These workers should also receive antiviral drugs as a prophylactic measure.
- The practice of marketing of live poultry directly to consumers should be discouraged in areas currently experiencing influenza outbreaks among poultry.
- During transporting and handling of poultry products from the area prone to have H5N1 it is continuously emphasizes the importance of good hygiene practices during handling including hand washing, prevention of cross-contamination and thorough cooking of poultry products. Eggs from infected poultry could also be contaminated with the virus and therefore care should be taken in handling shell eggs or raw egg products. In general, WHO recommends that foods should be cooked to reach an internal temperature of 70°C.

Vaccination

- The Avian vaccine was obtained from a human strain and is intended for immunizing people 18 through 64 years of age who could be at increased risk of exposure to the H5N1 influenza virus contained in the vaccine. H5N1 influenza vaccine immunization consists of two intramuscular injections, given approximately one month apart. The vaccine was tested for its safety on 103 healthy adults received a 90 microgram dose of the vaccine by injection followed by another 90 microgram dose 28 days later. In addition, there were approximately 300 healthy adults who received the vaccine at doses lower than 90 micrograms and a total of 48 who received a placebo injection. The vaccine was generally well tolerated, with the most common side effects reported as pain at the injection site, headache, general ill feeling and muscle pain. The study

showed that 45 percent of individuals who received the 90 microgram, two-dose regimen developed antibodies at a level that is expected to reduce the risk of getting influenza. Although the level of antibodies seen in the remaining individuals did not reach that level, current scientific information on other influenza vaccines suggests that less than optimal antibody levels may still have the potential to help reduce disease severity and influenza-related hospitalizations and deaths.

Epidemic containment

As soon as one suspect birdflu in any patient should be reported to the National Center For Diseases Control (NCDC) New Delhi immediately. There the team of epidemic investigation will take measures to control it.

Government has taken following actions in response to Pandemic swine flu and bird Flu:

- Inter Ministerial Task Force (IMTF) and Joint Monitoring Group (JMG) monitoring the situation.
- Enhanced surveillance at all International Airports to detect entry of disease into India at the earliest and contain the same.
- Travel advisory issued to defer nonessential travel to the affected countries.
- Tracking of persons travelled to India from affected countries
- States alerted to heighten the level of preparedness.
- IDSP focal points in States to look for and report clusters of Influenza Like Illnesses (ILI) and that of pneumonia
- Central and State rapid response teams (RRTs) alerted to investigate and manage suspected outbreaks.
- Identified labs at National and State level to test clinical samples of the novel virus.
- Guidance issued to States on clinical management, infection control practices, and laboratory support. These guidelines are also available on MOHFW web site.
- Availability of drug at all health institutions where suspected cases are screened.
- Availability of Personal Protective Equipment (PPE) increased. A special type of masks are advocated i.e. a N95 mask has 95% efficiency in filtering out particles greater than 0.3 micron under normal rate of respiration.
- IEC activities initiated in print and visual media
- 24X7 Control room activated
- Daily press briefing by identified authority.
- Administrative action at the state level
- Meeting under the Chairmanship of Chief Secretary with all concerned departments/ agencies.
- Liaison with State Disaster Management Authority for preparedness in sectors other than health.
- Screening at International Airports and assisting Airport Health Officers and airport Authorities in enhanced surveillance at all International Airports. Isolation / quarantine space at the airport or nearby hospital.
- Provide ambulance for shifting patient to identified hospitals.
- Ensure all staff including airport staff and immigration staff wears masks.
- DHS to hold meeting with all major hospitals in cities with international airports:

Active human surveillance is being undertaken to cover the population living within three-km radius of the infected villages/localities. No case of influenza like illness with history of exposure to infected poultry / poultry products has been reported.

The situation is being monitored. Central Government's Rapid Response Teams have been deployed at all epicenters. WHO continues to provide technical collaboration through the Union Ministry of Health and Family Welfare for outbreak containment. The Union Ministry of Health and Family Welfare has sent Tamiflu capsules, surgical masks, personal protective equipments, N-95 masks and ventilators to all states.

Delhi Declaration on Prevention and Control of Avian influenza and Pandemic Preparedness in Asia

In a conference of Ministers of Health and Agriculture/ Livestock on Avian Influenza Control and Pandemic Preparedness in Asia, New Delhi, India, 28 July 2006, it was deliberated that all countries would take appropriate measures to prevent and control avian influenza and pandemic preparedness in Asia. They had recognized the significant public health threat

posed by the emergence of HPAI with pandemic potential and the severe socioeconomic disruption, significant impact of H5N1 on poultry industry and livelihood of millions of small farmers including threat to agriculture they could cause. They also recognized the need for effective cooperation between animal health and human health agencies at all levels, within nations and internationally, for combating emerging zoonoses. The focus on development and strengthening of animal and human disease surveillance and response systems for early detection and prompt containment of avian influenza and other emerging zoonotic diseases is required. Improving bio-safety, infection control and bio-security measures and implementing necessary interventions with the help of regional and international collaboration to prevent the spread of animal diseases such as avian influenza to Humans taking into account relevant socio-behavioral, cultural and economic factors was also emphasized in the declaration.

Risk and outbreak communication

The main aim of health risk communicators is to transmit health information clearly to stakeholders in ways that encourage behavioral changes to reduce the risk. An enquiry into the social and political foundations on which risk is distributed in society may seem far removed from these aims but the way audiences respond to messages is dependent on their perceptions of risk distribution (Slovic 1987).

Risk communication guidelines widely used in public health are based on the psychometric paradigm of risk, which focuses on risk perception at the level of individuals. It can be understood as hazards that were new, uncontrollable and catastrophic in consequences were perceived as high risk, even when experts judged a low statistical probability of these risks occurring. In contrast, hazards or dangers that were familiar and controllable were perceived as low risk, even though statistically they had a high probability. In contrast to lay perceptions, expert perceptions of risk were based on expected annual mortality from a hazard or danger. So, infectious disease outbreaks and other public health emergencies are more than public health events and occur in a highly charged political, social and economic environment.

British sociologist Graham Murdoch et al (2003). has used Bourdieu's concept of society as a field to describe risk communication as occurring in an arena in which at least six sets of players compete for public attention. The players include political institutions and policy-makers, scientific and expert communities, campaigning groups and social movements, opposition parties and corporations, the media and the lay public (Murdock 2003).

Risk communication experts must understand the psychological fear, cultural and belief and blame systems exist in the society. Beside these a successful communicator is based on the truth (Abraham 2009). Communicators specializing in behaviour change communication and social mobilization have a variety of tools to deal with these issues and so they are often called on during outbreaks. It would be beneficial if these tools were incorporated into general outbreak communication principles. These tools are communication style, media, content, and principles. For example, choosing the best channel of communication to ensure visibility, targeting the primary audiences and finding spokespeople who provide legitimacy are some of the issues that need to be explicitly addressed.

COMMENTS

1. At most levels, focus of the Government machinery in India on rescue and relief operations only.
2. The Government machinery lacks:
   - Proper training in disaster management
   - Is ill equipped to tackle natural and man made disasters
   - mitigation and preparedness measures
3. Financial resource allocation to the long-term measures for mitigation and preparedness is minimal.
4. Necessity for changing the approach towards disaster management- only documented, never practiced. What is required from the Government is:
   - Actual commitment to setting up a comprehensive and effective disaster management apparatus
   - Willingness to channelize substantial financial resources
   - Ability to learn from the experiences of the past disasters.

EBOLA VIRUS DISEASE (EVD)

World Health Organization (WHO) has declared the current outbreak of Ebola Virus Disease (EBVD) in West African Countries a Public Health Emergency of International Concern (PHEIC) (WHO 2014). An outbreak of Ebola virus disease in the four West African countries Guinea, Liberia, Nigeria and Sierre Leone, has occurred and caused close to 2000 cases with more than 1000 deaths. This is the highest number of cases and deaths and the widest geographical spread ever known for an Ebola outbreak (WHO 2014, SEARO 2014). Though risk of spread of this disease to countries outside Africa is currently assessed to be low, there is a risk that the deadly virus could be imported to India if the large population of Indians working in the four affected West African nations returns.

Epidemiology of EBVD

Genus Ebolavirus is one of the three members of the *Filoviridae* family (filovirus), along with genus Marburgvirus and genus Cuevavirus. It comprises of 5 distinct sub-species: Bundibugyo ebolavirus (BDBV), Zaire ebolavirus (EBOV), Reston ebolavirus (RESTV), Sudan ebolavirus (SUDV) and Taï Forest ebolavirus (TAFV). Of these, BDBV, EBOV and SUDV have been associated with large EVD outbreaks in Africa. The current outbreak is being caused by Zaire ebolavirus subtype.

The natural reservoir host of ebolaviruses remains unknown. However, available evidence suggests that the virus is zoonotic (animal-borne) with bats being the most likely reservoir. Ebola is introduced into the human population through close contact with the blood, secretions, organs or other bodily fluids of infected animals. In Africa, infection has been documented among those handling infected chimpanzees, gorillas, fruit bats, monkeys, forest antelope and porcupines found ill or dead or in the rainforest Mourners who have direct contact with the bodies of the Ebola virus infected people as part of cremation/burial ceremonies are also at high risk of getting the infection. Health-care workers have frequently been infected while treating patients with suspected or confirmed EBVD when infection control precautions are not strictly practiced. It is important to understand that disease cannot be contracted through air, water and food. Also, if a person is in incubation period or is asymptomatic, he cannot not transmit the virus during this period. In order for the virus to be transmitted, an individual would have to have direct contact with an individual who is experiencing symptoms.

The viral illness has been characterized by sudden onset of fever (greater than 38.6 degree Celsius or 101.5 degree Fahrenheit), intense weakness, muscle pain, headache and sore throat. This is followed by vomiting, diarrhoea, rash, impaired kidney and liver function, and in some cases, both internal and external bleeding. Laboratory findings include low white blood cell and platelet counts and elevated liver enzymes. Symptoms may appear anywhere from 2 to 21 days after exposure to ebolavirus, although 8-10 days is most common (CDC 2014). However, it has been found that people are infectious as long as their blood contain and secretions have virus. For instance, men who have recovered from the disease can still transmit the virus through their semen for up to 7 weeks after recovery from illness (WHO 2014).

Before a patient is diagnosed as infected with EBVD, one should rule out malaria, typhoid fever, shigellosis, cholera, leptospirosis, plague, rickettsiosis, meningitis, hepatitis and other viral hemorrhagic fevers like dengue, yellow fever and kyasanur forest disease etc.[7] The disease can be definitively diagnosed by antibody capture-enzyme linked immunosorbent assay (ELISA), antigen detection tests, serum neutralization tests, reverse transcriptase-polymerase chain reaction (RT-PCR), electron microscopy and virus isolation be cell culture (WHO 2014).

As of now, the EBVD does not have any proven treatment nor any vaccine is available against the disease. Standard treatment of the disease in case of hemorrhagic manifestations comprises of symptomatic management in the form of balancing the patients' fluids and electrolytes, maintaining their oxygen status and blood pressure and treating any other complication

arising by virtue of the illness (MoHFW 2014). Experimental interventions like ZMapp has been developed but yet not been tested for individuals infected with Ebola virus (CDC 2014).

Prevention and Control

Traditional public health measures like early detection and isolation of cases, contact tracing and monitoring, and following rigorous procedures for infection control are the key to control the EBV outbreak, particularly in the scenario when no treatment or vaccine is available. Raising awareness about the Ebola infection in the community and usage of personal protective equipments (PPE) and other simple preventive measures while handing the infective materials/ secretions or body fluids of affected patients or animals are very important. Close contact taking care of the patients should also follow standard infection control practices. Any person coming from Ebola affected Areas (four West African countries) or coming in contact with suspected or laboratory confirmed EBVD and develops symptoms within 21 days should immediately report to health care facility. Further, those who have recovered from the disease should continue to follow infection control practices for a period of two months (MoHFW 2014). Health-care workers caring for patients with suspected or confirmed Ebola virus should apply, in addition to standard precautions, other infection control measures to avoid any exposure to the patient's blood and body fluids and direct unprotected contact with the possibly contaminated environment (WHO 2014). Safe disposal of dead body of the affected patient or animal is also pertinent to prevent the transmission of disease. Dead body should be packed with impermeable leaky proof body bags for safe disposal. Ritual activities after death should be strictly avoided. Those persons who are dealing with the disposal of dead bodies also require proper protection (MoHFW 2014).

Preparedness in India

Preparedness and vigilance are crucial elements in combating the spread of complex public health emergency like EBVD. Government has advised against all non-essential travel to the four affected countries (PIB 2014). Laboratory capacity has also been strengthened at the National Institute of Virology, Pune and National Centre for Disease Control, Delhi, to diagnose this disease. Emergency Medical Relief in the MoHFW was activated a 24-hour emergency helpline. In-flight announcements regarding the disease prior to landing, was being done by airlines. There were designated facilities at the relevant airports/ports to manage travellers manifesting symptoms of the disease. Mandatory reporting of passengers from affected countries was put in place at all the major airports in the country. Surveillance system at airports and ports was strengthened and Integrated Disease Surveillance Programme was put on alert. State authorities had been instructed to designate hospitals with isolation wards for response to possible cases and to stock personal protective equipment (PPE).

ZIKA VIRUS DISEASE

The Zika virus (ZIKV) is an arbovirus (RNA Flavivirus) that acquired its name from a forest close to Kampala (Uganda). A sylvatic yellow fever surveillance network in Uganda first identified the Zika virus in rhesus monkeys in 1947 (Dick 1952). In humans, it was first isolated in 1952, in Uganda and Tanzania. Since then there were few reports of detection of ZIKV from various part of Americas. Currently it is the largest epidemic of Zika virus infection ever recorded with 440,000 to 1,300,000 suspected cases reported by the Brazilian health authorities. There has been total death of 152 as of 21 October 2015 in the world. 3-4 million people may be infected since 2015. After substantial spike of cases of Microcephaly and Guillain-Barre Syndrome over the Americas, on 1st February 2016 Zika virus was declared as public health emergency of International concern (PHEIC) (WHO 2016).

The risk of countries outside Americas to be affected by Zika virus is low, but there is a threat that the virus may spread to Asian nations including India, Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. Hence, it becomes important to strengthen national framework for early detection, immediate management and timely containment.

Epidemiology

The natural reservoir of Zika viruses remains unknown. However, available evidence suggests that the virus is zoonotic (animal- borne) with west African monkeys, rodents, orang-outang, zebras, elephants, etc. being the most likely reservoir. Zika virus is transmitted to people

primarily through the bite of an infected *Aedes* species or *Culex* mosquito. These are the same mosquitoes that spread dengue and chikungunya viruses. These mosquitoes typically lay eggs in and near standing water in things like buckets, bowls, animal dishes, flower pots and vases. They are aggressive daytime biters, prefer to bite people, and live indoors and outdoors near people. A mother already infected with Zika virus near the time of delivery can pass on the virus to her newborn around the time of birth, but this is rare. It is possible that Zika virus could be passed from mother to fetus during pregnancy.

About 1 in 5 people infected with Zika virus become ill (i.e., develop Zika) (CDC 2016). The symptoms appear after an incubation period of a few days after the bite of an infected mosquito and usually last three to 12 days. Asymptomatic presentations are frequent but ZIKV infection can cause a broad range of clinical symptoms, presenting as a "dengue-like" syndrome. The symptoms can include: arthralgia, edema of extremities, mild fever, headaches, retro-orbital pain, conjunctival hyperemia and maculopapular rashes usually spreading downward from the face to the limbs and frequently pruritic, vertigo, myalgia, and digestive disorder (CDC 2016). People typically recover in 2 to 7 days, and death is rare (Ross J 2016). The disease is also being linked to microcephaly, the disease which damages cells of newborn babies' brain causing smaller head size for entire life. The ailment is uncurable (Shaikh 2016).

Zika virus testing of maternal serum includes reverse transcription-polymerase chain reaction (RT-PCR) testing for symptomatic patients with onset of symptoms within the previous week. Immunoglobulin M (IgM) and neutralizing antibody testing should be performed on specimens collected e"4 days after onset of symptoms.

Before a patient is diagnosed with Zika Virus Disease one should rule out dengue, chikungunya, west nile fever, malaria, yellow fever, KFD and typhoid fever (Ioos S, 2014). As of now there is no commercially available test for Zika virus disease. Serological tests are not recommended (MoHFW 2016).

Criteria for diagnosing the Zika virus disease for epidemiological purpose are as follows:

SUSPECT CASE is a patient with skin rash or elevation of body temperature (>37.2C) with one or more of the following symptoms (not explained by other medical conditions): (a) Arthralgia, (b) Non-purulent conjunctivitis or conjunctival hyperemia, (c) Headache or malaise. With history of travel to countries with indeginous transmission of Zika in last 2 weeks.

CONFIRMED CASE- A suspected case with laboratory positive result for the specific detection of zika virus by PCR.

Treatment

As of now No vaccine or medications are available to prevent or treat Zika infections. The mainstay of management includes bed rest and supportive care. Symptomatic treatment includes increased intake of fluids to prevent dehydration, medicines such as acetaminophen or paracetamol, to relieve fever and pain, Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDs), like ibuprofen and naproxen should be avoided until dengue can be ruled out to reduce the risk of hemorrhage (bleeding). Additional medication for another medical condition should be taken under strict supervision of healthcare provider.

Clinical trials reveal inventions like ZIKAVAC claimed by Hyderabad based firm have been developed which showed positive test results on animal tests but not yet tested on humans and for individuals affected with Zika virus disease.

Prevention and control

Prevention and control measures should be directed at the reduction of vector density as a fundamental strategy to prevent transmission. The Integrated Management Strategy for the Prevention and Control of Dengue (IMS – Dengue) provides the basis for preparedness for Zika virus which include Intersectoral participation and collaboration at all levels of government and health, education, environment, social development and tourism sectors and Participation of non-governmental organizations (NGOs) and private organizations; Maintain risk communication and mobilization for the whole community (PAHO 2016). National Institute of Virology (NIV) in Pune has prepared itself to offer testing for Zika virus detection where if needed Zika virus suspected acute samples can be tested.

SENDAI FRAMEWORK

The Sendai Framework for Disaster Risk Reduction 2015-2030 (hereafter "Sendai Framework") adopted at the Third UN World Conference in Sendai, Japan, on March 18, 2015 (UNISDR 2015a) as the successor instrument to the Hyogo Framework for Action 2005-2015. It is a non-binding agreement, which the signatory nations, including India, will attempt to comply with on a voluntary basis. However, India will make all efforts to contribute to the realization of the global targets by improving the entire disaster management cycle in India by following the recommendations in the Sendai Framework and by adopting globally accepted best practices.

The Sendai Framework followed by the Sustainable Development Goals 2015 – 2030 in September, and the UNCOP21 Climate Change agreement to combat human-induced climate change in December. DRR is a common theme in these three global agreements. The Paris Agreement on global climate change points to the importance of averting, minimizing, and addressing loss and damage associated with the adverse effects of climate change, including extreme weather events and slow onset events, and the role of sustainable development in reducing the risk of loss and damage. These three agreements recognize the desired outcomes in DRR as a product of complex and interconnected social and economic processes, which overlap across the agendas of the three agreements. Intrinsic to sustainable development is DRR and the building of resilience to disasters. Further, effective disaster risk management contributes to sustainable development.

In the domain of disaster management, the Sendai Framework provides the way forward for the period ending in 2030. There are some major departures in the Sendai Framework:

- For the first time the goals are defined in terms of outcome-based targets instead of focusing on sets of activities and actions.
- It places governments at the center of disaster risk reduction with the framework emphasizing the need to strengthen the disaster risk governance.
- There is significant shift from earlier emphasis on disaster management to addressing disaster risk management itself by focusing on the underlying drivers of risk.
- It places almost equal importance on all kinds of disasters and not only on those arising from natural hazards.
- In addition to social vulnerability, it pays considerable attention to environmental aspects through a strong recognition that the implementation of integrated environmental and natural resource management approaches is needed for disaster reduction
- Disaster risk reduction, more than before, is seen as a policy concern that cuts across many sectors, including health and education

The Sendai Framework notes the need of strengthening of disaster risk governance and coordination across various institutions and sectors. It requires the full and meaningful participation of relevant stakeholders at different levels. It is necessary to invest in the economic, social, health, cultural and educational resilience at all levels. It requires investments in research and the use of technology to enhance multi-hazard Early Warning Systems (EWS), preparedness, response, recovery, rehabilitation, and reconstruction.

The four priorities for action under the Sendai Framework are:

1. Understanding disaster risk
2. Strengthening disaster risk governance to manage disaster risk
3. Investing in disaster risk reduction for resilience
4. Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation and reconstruction.

References

Abraham T. Risk and outbreak communication: lesson from alternative paradigm. Bull World Health Organ 2009;87:604–607.

Bird Flu. http://www.oie.int/eng/normes/mcode/en_ chapitre_ 1.7.6.htm

CDC. About Ebola Hemorrhagic Fever. [Internet] 2014 [Accessed on 2014, Aug 14; Updated on 2014, Aug 5]. Available from: http://www.cdc.gov/vhf/ebola/about.html.

CDC. Questions and Answers on Experimental Treatments and Vaccines for Ebola. [Internet] 2014 [Accessed on 2014, Aug 14; Updated on 2014, Aug 8].

CDC. Zika Virus. [Internet] [Accessed on February 19 2016] Available on: [http://www.cdc.gov/zika/.html]

DGHS-WHO. Disaster Preparedness: Review and Planning Meeting (A report). Min. of H&FW, Nirman Bhawan, New Delhi 1992.

Dick GW, Kitchen SF, Haddow AJ. Zika virus isolations and serological specificity. Trans R Soc Trop Med Hyg.

1952;46:509–20. DOI: 10.1016/0035-9203(52)90042.
Govt. of India (2001) Developing a surveillance mechanism for pathogens of Biological Warfare Potential (Recommendation of Workshop). National Institute of Communicable Diseases (NICD), Min. of Health, New Delhi, Sept 18th & 19th.
Govt. of India. Annual Report 2005-2006. Min of H & FW, Nirman Bhawan, New Delhi.
Harris S (1992) Japanese biological warfare research on humans: a case study of microbiology and ethics. Annals NY Acad Sci; 666:21-52.
International federation of Red Cross and Red Crescent Societies. World Disaster Report 1993, Dordrecht Netherlands Martinus Nijhoff 1993.
Ioos S, Mallet HP, Goffart IL, et.al. General Review Current Zika Virus Epidemiology and Current Epidemics. Médecine et maladies infectieuses 44 (2014) 302–307.
Kaufmann AF, et.al. The economic impact of a bioterrorist attack. Emerging Infect Dis; 3 (2): 83-94.
Kishore J. Bio-terrorism: a public health menace. Employment News 2001; 26 (35):1-3.
Kishore J, Mamta. Swine Flue update. Bulletin of DMA 2009.
Kishore J. Bio-terrorism: a threat to the scientific development. Boi-chemical and Cellular Archives 2002; (1&2): 1-12.
Kumar Santosh. From risk to resilience. Yojana 2009; June: 23-26.
Menon NVC. Paradigm shift in managing disaster. Yojana 2009; June: 8-13.
Murdock G, Petts J, Horlick-Jones T. After amplification: rethinking the role of media in risk communication. In: Pidgeon N, Kasperson R, Slovic P, eds. *The social amplification of risk*. Cambridge: Cambridge University Press; 2003.
MoHFW, GoI. Clinical Case Management guidelines of Ebola Virus Disease. [Internet] 2014 [Accessed on 2014, Aug 14; Updated on 2014, Aug 14]. Available from: http://mohfw.gov.in/showfile.php?lid=2899
MoHFW, GoI. Clinical Case Management guidelines of Ebola Virus Disease. [Internet] 2014 [Accessed on 2014, Aug 14; Updated on 2014, Aug 14]. Available from: http://mohfw.gov.in/showfile.php?lid=2899
MoHFW, GoI. Ebola Virus Factsheet. [Internet] 2014 [Accessed on 2014, Aug 14; Updated on 2014, Aug 14]. Available from: http://mohfw.gov.in/showfile.php ?lid=2887
MoHFW, GoI. Ebola Virus Factsheet. 2014. Available from: http://mohfw.gov.in/showfile.php ?lid=2887
MoHFW, GoI. Frequently asked questions. 2014. Available from: http://mohfw.gov.in/showfile.php? lid=2907
National Institute of Health & Family Welfare. Disaster Management (Module 9). New Delhi 67.
Pan American Health Organization. WHO Regional office of Americas. Preliminary guidelines for the surveillance of microcephaly in newborns in settings with risk of Zika virus circulation January 21 2016. Available on: http://www.paho.org/hq/index.php?option=com_ docman & task=doc_view & Itemid=270&gid=33000
Planning Commission. Eleventh Five Year Plan. Govt. of India.
Press Information Bureau, GoI. Ebola Virus Disease. 2014. Available from: http://pib.nic.in/newsite/efeatures.aspx?relid=108435
Rosen P. Coping with bio-terrorism: Is difficult, but may help us respond to new epidemics (editorial). BMJ 2000; 320:71-72.
Ross J. What you need to know about Zika virus. [Accessed on February 19 2016] Available on:http://www.health.harvard.edu/ blog/what-you-need-to-know-about-zika-virus-201602019114
SEARO, WHO. Preparedness is key to our fight against Ebola. [Internet] 2014 [Accessed on 2014, Aug 14]. Available from: http://www.searo.who.int/mediacentre/ features/2014/preparedness-is-key-to-our-fight-against-ebola/en/
Shaikh MU. Zika Virus Harmful For Pregnant Women: Indian Medical Assosiation. Available on: http://www.india.com/news/india/zika-virus-harmful-for-pregnant-woman-indian-medical-association-900101/
Sharma R. India wakes up to threat of bioterrorism. BMJ 2001 ; 323:714
Slovic P. Perception of risk. *Science* 1987;236:280-5.
Spencer RC, Lightfoot NF. Preparedness and Response to Bioterrorism. Journal of Infection 2001; 43:104-110.
Travelers' Health: Travel Notices. Centers for Disease Control and Prevention. 15 January 2016. Petersen, Emily E.; Staples, J. Erin; Meaney-Delman, Dana; Fischer, Marc; Ellington, Sascha R.; Callaghan, William M.; Jamieson, Denise J. (2016). "Interim Guidelines for Pregnant Women During a Zika Virus Outbreak – United States, 2016".*Morbidity and Mortality Weekly Report 65 (2): 30–33*
WHO Media Centre: WHO Statement on the meeting of the international health regulations Emergency Committee Regarding 2016 Zika Outbreak in Americas.[Internet]2016 [Accessed on 2016, jan 12; Updated on 2016, Jan 14] Available from http://www.who.int/mediacentre/news/statements/2016/emergency-committee-zika
WHO. Global Alert and Response: Ebola virus disease update-west Africa. [Internet] 2014. Available from: http://www.who.int/csr/don/2014_08_13_ebola/en/
WHO. Global Alert and Response: Ebola virus disease update-west Africa. [Internet] 2014. Available from: http://www.who.int/csr/don/2014_08_13_ebola/en/
WHO. Media center: Ebola Virus Disease Factsheet. [Internet] 2014 [Accessed on 2014, Aug 14; Updated on 2014, April]. Available from: http://www.who.int/mediacentre/factsheets/fs103/en/
WHO. Media center: Ebola Virus Disease Factsheet. [Internet] 2014 [Accessed on 2014, Aug 14; Updated on 2014, April]. Available from: http://www.who.int/mediacentre/factsheets/fs103/en/
WHO. Media center: WHO Statement on the Meeting of the International Health Regulations Emergency Committee Regarding the 2014 Ebola Outbreak in West Africa. [Internet] 2014. Available from: http://www.who.int/mediacentre/news/statements/2014/ebola-20140808/en/
WHO. Media center: WHO Statement on the Meeting of the International Health Regulations Emergency Committee Regarding the 2014 Ebola Outbreak in West Africa. [Internet] 2014 [Accessed on 2014, Aug 14; Updated on 2014, Aug 8]. Available from: http://www.who.int/mediacentre/news/statements/2014/ebola-20140808/en/
WHO. Community Emergency Preparedness. A Manual for managers and policy makers. WHO, Geneva 1999.
Zhao Z, Zhang F, Xu M, et al. Description and clinical treatment of an early outbreak of severe acute respiratory syndrome (SARS) in Guangzhou, PR China. J Med Microbiol 2003; 52: 715-20.

CHAPTER 34

SCHOOL HEALTH SERVICES

INTRODUCTION

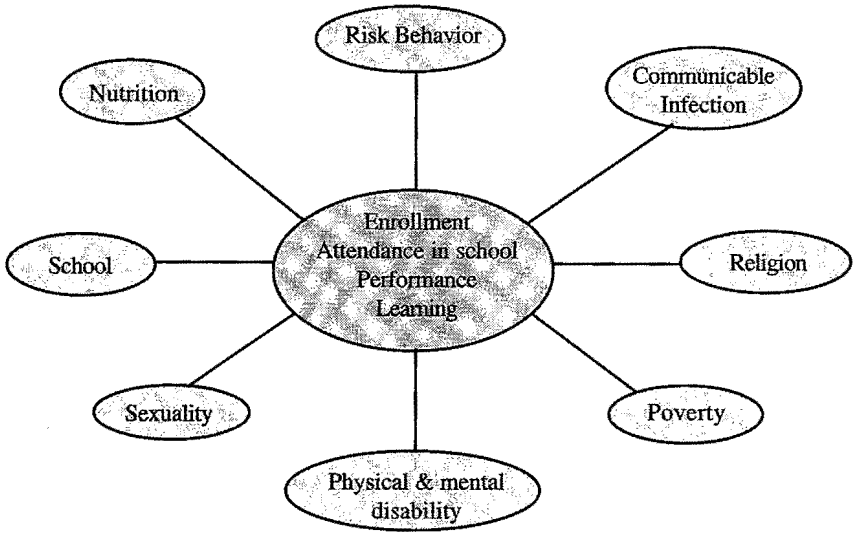
Schools are sacred because they provide an environment, for learning skills, and for development of intelligence that can be utilized by students to achieve their goals in life. It is also observed that "to learn effectively, children need good health." Health is a key factor in school entry, as well as continued participation and attainment in school. However, there are various reasons for non-enrollment, poor performance & learning in school (Figure 34.1). More than half of the world's population is below the age of 25 years and majority in the age group of 10-25 years from developing countries (UN 1988). If we fail to nurture their health, their hopes, and their skills, destabilizing effect on the political, social and economic system could be immense. The health benefits of education are profound especially with regard to girls. Evidence for the benefit of education to girls themselves, their future children, and their society is overwhelming (Kishore 2002).

SCHOOL HEALTH PROGRAMS

History World:

In 1850, the Sanitary Commission of Massachusetts, headed by Lemuel Shattuck, produced a report that has become a classic in the field of public health and had a significant influence on school health. The provisional definition of a comprehensive school health program (CSHP) adopted by the Committee on

Figure 34.1 Reasons for non-enrollment, poor performance & learning in school



Comprehensive School Health Programs was as follows:

"A *comprehensive* school health program is an *integrated* set of *planned, sequential, school-affiliated strategies, activities,* and *services* designed to promote the optimal physical, emotional, social, and educational *development* of students. The program *involves* and is *supportive of families* and is *determined* by the *local community* based on community *needs, resources, standards,* and *requirements.* It is *coordinated* by a *multidisciplinary team* and *accountable* to the community for program *quality* and *effectiveness.*"

Beginning about the year 1880, most states of America passed laws requiring the schools to give instructions concerning the ill effects of alcohol and narcotics (Irwin et al. 1956). In 1890s, Physicians and nurses were hired in USA to examine children in school and exclude the potentially contagious. The aim of such activity was to conduct surveillance and to protect school community. In early 1900s, school health services spread with main aim to help poor children. After 1920s, health education, immunization, screenings, care for minor injuries, referrals for diagnosis & treatment were included. Subsequently, nurse practitioners, school-based health centers, school-based mental health programs were introduced.

Concept

School health programs are those that promote health through schools. These embody the total school program in health involving all health activities that are planned, organized and conducted by the school and are under the jurisdiction of the school. These also include all school based activities that contribute to understanding, maintenance and improvement of the health of the school population including health services, health education, and healthful school environment.

The School Health Programme intends to cover 12,88,750 Government and private aided schools covering around 22 Crore students all over India.

Benefits of school health programs

School health programs have a beneficial impact on students, family, nation and all people at large because of following reasons:

1. Investment in school health programs is the most efficient and cost effective way to improve students' health, and consequently their academic performance. Beside the students, teachers and other staff also get health benefits.
2. According to estimates, every US$ 1.00 investment in schools on effective antitobacco education saves US$ 18.80 in the costs of addressing health and non-health problems associated with smoking. Similarly an average, the money saved by society for each US$ 1.00 spent on education in schools about smoking, alcohol and unprotected sexual behavior, is approximately US$ 14.
3. Schooling pays by generating higher incomes and a healthier workforce (WDReport 1993).
4. It has been estimated that 1.3 years of schooling to the mother reduces child mortality by about 15%. More years of education a female receives, the more likely it is that her children will survive the first 5 years of life (WD Report 1993).
5. School food programs also have a marked effect on attendance and school performance (Levinger 1994).
6. Carefully designed and implemented comprehensive health education curricula can prevent certain adverse behaviors, including tobacco use, illicit drug use, unhealthy dietary practices, unsafe sexual behavior, and physical inactivity (Nelson 1991, Perry 1986, Kirby 1994).
7. School setting provides an efficient means of improving young people's health, self esteem, life skills (abilities related to effective decision-making, communication, understanding emotions, critical thinking, coping with stress, etc.) and behavior. School can also provide the setting to introduce health information and technologies to the community and can lead the community by advocating policies and services that promote health.
8. Schools can reach about one billion students worldwide everyday and, through them, their families and communities that is the world' broadest and deepest channel for putting information at the disposal of its citizens (Unicef 1988).

Components of School Health Services

A comprehensive school health program must be implemented in an organized and strategic manner consisting of the following components:

I. Health service provision:

- Screening, health care and referral:
  - o Screening of general health, assessment of Anaemia/Nutritional status, visual acuity, hearng problems, dental check up, common skin conditions, Heart defects, physical disabilities, learning disorders, behavior problems, etc.
  - o Basic medicine kit will be provided to take care of common ailments prevalent among young school going children.
  - o Referral Cards for priority services at District / Sub-District hospitals.
- Immunisation:
  - o As per national schedule
  - o Fixed day activity
  - o Coupled with education about the issue
- Micronutrient (Vitamin A & IFA) management:
  - o Weekly supervised distribution of Iron-Folate tablets coupled with education about the issue
  - o Administration of Vitamin-A in needy cases.
- De-worming
  - o As per national guidelines
  - o Biannually supervised schedule
  - o Prior IEC
  - o Siblings of students also to be covered
- Health Promoting Schools
  - o Counseling services
  - o Regular practice of Yoga, Physical education, health education
  - o Peer leaders as health educators.
  - o Adolescent health education-existing in few places
  - o Linkages with the out of school children
  - o Health clubs, Health cabinets
  - o First Aid room/corners or clinics.

II. Capacity building

III. Monitoring & Evaluation

IV. Mid Day Meal

1. **School health care services** include preventive, curative and referral services focusing not only on students but also school staff.

   Health appraisal can be instituted by doctor, health worker or teacher.

   (a) Regular periodic medical examination should be carried out by medical officer or health worker at least once in a year and doctor or health worker should be available to handle any emergency health need of students or school staff. The initial examination should be thorough with appropriate laboratory tests to detect most of the common preventable diseases. Similarly, school personnel should undergo periodic examinations for communicable diseases and other debilitating diseases.

   (b) Daily inspection of students by the school teacher helps the students to bring a change in their day to day hygiene practices and also early detection of any behavioral or physical disorder. It is expected from the teacher to look into following aspects: i) general appearance, ii) any rash or skin eruption, iii) change in face color, or contour, iv) running nose, v) cough, vi) fever, vii) neck rigidity, or any other postural change, viii) red or watery eyes, ix) nausea or vomiting, x) passing loose stools, xi) pain in eyes, or any part of the body, xii) headache, and xiii) any other abnormal sign or symptom.

   (c) A health record card is maintained by teacher and whenever there is a need for consultation from health workers the card can be sent with the student to record findings and management. Effective treatment and follow-up should be instituted through special clinics. One such clinic or health center covering 5000 students in urban areas and one for less than 5000 in rural areas can be established in one of the schools. Specialist services like dental, eyes, ENT and mental health can be delivered on few days of the month and these days should be intimated in advance to all the schools and students. Provision for beds in general hospitals, or referral hospitals is also required. School health services should have special focus on the common endemic diseases. Dental health and eye care need special emphasis in service delivery. Dental hygienists and ophthalmic assistants should also be included in the school health care team.

   First aid and emergency care must be available in school. For this all teachers and students must undergo training. In-service training for teacher should also focus on refreshing their skills. First aid should include cardiopulmonary resuscitation, applying splints, rescuing from electric shock, or drowning, applying bandages,

transporting sick person, and management of minor injuries, etc.

2. **School health education** includes academic skills and knowledge development; health and nutrition education; first aid, life skills education and also staff education through training and development of school personnel. Good personal hygiene includes clean skin, hair, clothes, and teeth. Physical health is learned by regular exercise, correct sitting posture, reading style, standing posture, interest in play activities, and interest to maintain healthy body. Mental hygiene includes good behavior, thoughts and attitudes towards self and others. Students should be involved in vaccination Programs, environmental pollution control Programs and other community based projects like construction of latrines, sanitary wells, and chlorination of water, etc. Health education should be carried out by teachers themselves with the support of medical officer and public health nurse. One of the major components of the health education is high risk behavior and injuries prevention not only at the school but also in the community. Student should also learn prevention of injuries on road through learning traffic rules and regulation.

3. **School health environment (physical and psychosocial):** This includes safe water supply and sanitation services, healthy organization culture, good location, structure, and green and safe environment. Space should be 10 square feet per student of a classroom subject to a maximum of 40 in one class. Classroom should have sufficient cross ventilation, lighting, and furniture with safety designs. Water supply, lavatory and eating facilities should be such that further help the development of a healthy environment. Disabled and handicapped children need special care during their schooling. Special schools are required to impart education to visually blind and mentally handicapped children. Provisions are already made for equal opportunity in education and services. There should not be any discrimination of a child on the basis of caste, color, race, religion, community, group, or socioeconomic status in the school.

4. **Health promotion for school personnel:** Teacher should understand that students copy them as a role model.

5. **School-community projects and outreach:** in difficult terrains and hilly areas involvement of non-government organizations and private practitioners may be required for students to be safely and constructively involved in community development project.

6. **Nutrition and food safety:** Improving nutrition by providing mid-day meal or food during school time helps the child to improve school attendance and academic performance (Nagarajan et al 1982, Harriss 1991, Thangaraj 2002). In the Mid-Day Meal Program of Government half of the protein and one third of calories requirement of the child is provided by the school free of cost. Lunch or meal should be made available on no-profit no loss basis by the school authority.

7. **Physical education and recreation:** Physical education and recreation activities are the essential components of overall development of children. It provides opportunities for building self-confidence and encouraging friendships between boys and girls groups.

8. **Mental health, counseling, and social supports**: Beside home, the school is the place where a child's behavior and attitudes are developed. One should exploit the opportunity available in school to prevent juvenile delinquency, maladjustment, drug addiction, risk behavior and unsafe sexual practices that are common problems in children.

II. Capacity building

All level of workers and also teaching staff must be trained on various aspect of school health.

III. Monitoring & Evaluation

System of monitoring and evaluation should be developed to see whether the program is running smoothly and having appropriate effect on the students.

IV. Mid Day Meal

Mid day meal has been incorporated in school

program to improve the nutrition and also performance of the child.

Strategies

1. *Vision building and strategic planning:* A well planned national and local commitment helps in effective planning and implementation of school health Programs.
2. *Advocacy:* involves the synthesis and direct simple presentation of information derived from experts concerning the critical linkage between health and education, and the way in which school health Programs can benefit students, staff, families, communities and countries.
3. *Networking and planning:* Achieving targets and goals requires the networking and collaboration of interested people in the field of technology, management, and finance related to school health Programs. This also facilitates the informal exchange of ideas, experience, and educational materials at international and local levels.
4. *Resource mobilization and allocation:* These are essential components of a sustainable school health Programs. Resources should be sought from community, individuals, private enterprises and international agencies.
5. *Capacity building:* Educators, teachers, health workers and institutions must acquire the information, skills, and resources necessary for the effective implementation of school health programs.
6. *Operations research:* Programs and strategies must be experimented with and evaluated to improve and replicate them in areas wherever possible. For example, child-to-child education or child-to-parent education are some methods of involving children and parents in school health programs.

School Health Program should focus on the needs of adolescent boys and girls in a meaningful manner. District school health program should be restructured, hitherto approach of detection of defects through periodic medical checkup should be done away and sound awareness Programs on relevant health issues should be addressed with focus on action, group demonstration, and peer group involvement and preparation of relevant communication material (Lal 2001).

School Mental Health Program

In 11th Plan (draft) there is emphasis on school mental health program. WHO report on mental health estimates that the global that the global burden of serious emotional disturbances in children and adolescents is up to 15%. ICMR (2001) study found 12.8% of children and adolescents suffering from mental and behavior disorders. Child mental health care received scant attention in service, research and training aspects in the national context, despite sound policy guidelines.

The school plays a crucial role in the development of cognitive, linguistic, social, emotional and moral functions and competencies in a child. However, in the contemporary system of education, schools have seriously marginalized and compromised on their role in guiding, regulating the psychological development of children and promoting psychosocial competencies as they have to cope with heavy syllabi and curricula, poor teaching facilities and highly competitive examinations. In addition, there is low priority in national planning limitation of resources and commercialization of education. School education has become a serious source of stress for children and parents.

School phobia, psychosomatic complaints, emotional/ behavioral problems, poor sleep and appetite, difficulties in coping and declining scholastic performance are common manifestation of stress in school children.

Issues of well-being and psychosocial competence affect the entire school community including students, teachers, school administrators, members of the surrounding community. Specific mental health programs addressing these issues improve coping skills, decrease stress, and increase support for a healthy school community. Mental health and learning go hand-in-hand.

Psychosocial issues in schools:

Level I and II: primary prevention and health promotion target the causes of healthy and unhealthy conditions with interventions to promote healthy behaviors and prevent a disorder from developing.

Level III: secondary prevention targets the population

at risk to protect them against the onset of disorders. Level IV: Targets the people who have developed the disorders and aims at helping in the management, reducing the impairment and preventing relapse.

Comprehensive life skills education starts in school in adolescent groups: A) at junior level (<12 years of age) workshops, seminars and camps need to be organized for teachers, parents and counselors in the primary and middle school sections in which childhood development, emotional and behavioral problems should be discussed. The problems should be covered in these sessions are: adjustment disorders, conduct disorders, anxiety, depression, enuresis, school phobia, mental retardation, learning disability. B) A cascade strategy for disseminating life skills education should be used in the adolescent population. Step I: training workshops with school counselors, interested teachers need to be conducted to orient them to the rationale for life skills education and its methodology, relevance in school setup, anticipated difficulties in cooperation of school administration, resource availability and continuity of the program. Step II: these counselors / teachers should identify "peer trainers" who have the qualities of leadership, motivation, psychological orientation, peer acceptance and consistent school record. Step III: Training of the peer trainers should be done by selecting few students who represent classes and sections and they are trained in group building, family communication, heterosexual relationships, handling emotions such as anger and loss, stress and coping, substance abuse and high risk behaviors, growing with adolescent sexuality (HIV/ AIDS, and making healthy choice). Step 4: The peer trainers along with their counselors and teachers then should go to train other students in their school using the same teaching schedule. Step V should focus on feedback supported by professional help.

Indicators for Assessment of School Health Programs

Following indicators assessing school health programs for planning, implementation and monitoring are suggested: (1) Indicators of children's health status, (2) Indicators of ability to learn and learning achievements, (3) Indicators of health behavior, (4) Indicators of the quality of school health programs, and (5) Policy indicators.

SCHOOL HEALTH PROGRAM IN INDIA

Gurukuls were the place where physical education in the form of yoga was also taught. Buddhist and Jain monasteries were famous for mental health more than physical health of the disciples. But there was no formal curriculum on devoted on health in educational system till the end of 19th century. Earliest effort in school health in India was seen in 1909 where state of Baroda started medical inspection in schools. Subsequently other states also joined the group and started medical examination in schools. Delhi started medical inspection in 1927.

Since independence a number of committees were set up on topics in relation to school health. In 1961, the Rennuka Ray School Health Committee found the gaps in provision of school health through medical officers of the primary health center and laid the foundations for a comprehensive school health programme. It also recommended that "Health education should be included as part of general education in the primary, middle and secondary schools." Notable in the context of school health are the project on Nutrition, Health Education and Environmental Sanitation (NHEES) and the efforts of bodies like National Council of Educational Research and Training (NCERT). The committee recommended that in the first phase (1962-66) school health services should be developed in an area close to primary health unit to cover 40 primary schools and in cities all primary school children in slums must be covered. In the second phase (1966-71) these services should be extended to all primary schools in both rural and urban areas (GOI 1960-61). Again the progress in this direction has been rather very slow (Lal 1998).

It is suggested by the School Health Committee that primary health centers should also cover schools in their jurisdiction for health care delivery including inspection. One PHC is responsible for more than 5000 students per year. In urban area school health service schemes are run by corporation or non-governmental organization. Both the national policies on health (1983) and education (1986) strongly supported school health programs, particularly school health education.

The government of India appointed task force for School health in 1981 and proposed to intensify services on pilot basis. Through the Minimum Need Program Center provided assistance to states to procure medical examination kits, health education material and training material for teachers. Both the national policies on health (1983) and education (1986) strongly supported school health programmes, particularly school health education (SHE).

Different states have their own schemes, e.g., Andhra Pradesh School Health Project, an externally aided project covering primary schools and MCD and Delhi Government school health programs. It is to be noted that school health services remained and remain a state responsibility as are the main public health measures, the private sector playing little or no role.

School Health Schemes in Delhi

In Delhi the school health services are provided by multiple agencies which cover a total of approximately 3700 schools with around 19 lakh students. Agency-wise distribution of schools is given in table 34.1.

Government of National Capital Territory of Delhi

Directorate of Health Services, Govt. of NCT Delhi, started School health scheme in March 1979 with six School health clinics initially which were later increased to provide comprehensive health care services to the school going children. The School Health clinics were established in the school premises itself for easy accessibility to children. These were planned to cover the children studying in Government and Government Aided Secondary schools. A School Health Clinic and Subclinic (situated in school premises) is staffed with Medical officer, Public health nurse, pharmacist, computer data entry operator and attendant. In a special referral center (situated in school premises) the staffed is specialists (dental, eye and ENT), public health nurse, dental hygienist, refractionist, pharmacists, computer data entry operator and attendant.

It actually covers around 575 schools and 5.33 lakh children (DHS 2004). Around 379 schools are allotted to NGOs by DHS for the school health services. The Scheme has following objectives: 1) Promotion of positive health, 2) Prevention of diseases, 3) Early detection, diagnosis and treatment of diseases, and 4) Referral of children who require specialist treatment to school referral clinics. It runs 65 school health clinics and each clinic covers 5000-6000 students (Aggarwal & Chaturvedi 2000).

Implementation of the School Health Scheme

Implementation of the SHS is through the Medical Officers who head the school health team in School Health Clinic and in Sub Clinics. The school health team is responsible for the conduct of health examination and undertakes the following activities to change Attitudes, Beliefs and Practices of School Children by providing them adequate knowledge about healthy practices and developing healthy habits amongst them. The strategies used are.

- School to Child dissemination of information
- Child to Child dissemination of information
- Child to Family/Parents dissemination of information
- Child to Community dissemination of information

Detailed Health Examination of all children to be conducted at least at the time of

— Entry to the Middle School
— Entry to the Secondary School
— Entry to the Senior Secondary School

Recent activities

1. Diabetes and hypertension screening of school going children as per the recently launched Govt. of NCT of Delhi programme namely Diabetes control programme and Govt. of India launched programme namely prevalence of diabetes & hypertension in urban slums
2. School Health Melas were organized in the various School premises.
3. Up gradation of SRCs & SHCs– The presently functioning SRCs have been equipped with RVG machines for performing various dental manuvers. Various SHCs have also been equipped with AED machine to handle any unforeseen emergencies.
4. Fourteen new SHCs have been added to the School Health Scheme since August 2008.
5. A separate logo for School Health Scheme has been developed & adopted. This logo is meant for exclusive use by School Health Scheme only.
6. Various painting competitions were organized by School Health Clinics to disseminate the Health

Education & inculcate Healthy practices & better life style.

7. To provide first response emergency kit to all the School Health Clinics.

Expansion of school health scheme in 2011

Technical Advisory Committee (TAG):- A Technical advisory committee of experts from various faculties including sports medicine, social and mental health, orthopedics, Eye, ENT, Dental, adolescent health etc is under process to chalk out various guide lines to fulfill our extended goals: 100 School health Clinics, 11 SRC, 11 Mobile clinics; One clinic for 12 clusters schools: Total 100 SHCs to be established; One SRC for each district: Total 11Clinics to be established; One Mobile Clinic for each District -Total 11 to be established.

Computerization of SHS: There are 14 lakh School Children who are covered by SHS. SHS is planning the Computerization of School Health Scheme which would involve installation of computer and a smart card reader in the clinic.

Smart Card: SHS is planning to procure smart cards with all mentioned data of the school children which can be handed over to the child when he/she leaves the school. Besides complete health information, this card will contain personal and academic information including his certificates and other documents in e-form which he can carry in his pocket while travelling.

Mass Deworm: SHS is coordinating with an International organization "De-worm the world" for the de-worming of 14 lakh children of Govt. and aided schools of Delhi.

Mass Oral Health Campaign: SHS is planning to organize an oral health campaign. The objective of this campaign is to promote healthy habits among children & spread a positive health message to the family.

Video Spots & Documentery Films: As Audio - visual spots and Documentary Films are very effective promotional tools to create awareness and sensitize the school children , SHS plans to prepare Video Spots & Documentary Films on common health related problems that are prevalent in Indian society.

Hoarding: School Health Scheme is planning to display hoardings at the gate of each school on healthy eating habits and other health related information.

News Letter: SHS is planning to publish a News Letter for the awareness among the staff of educational department and school children on various diseases and health related problems prevalent in school children along with all relevant news and achievements of SHS.

Magic Show: SHS provides health education to school children on various topics such as bad habits prevalent in school children, communicable and non communicable diseases & health related problems in school children by organizing Magic Show in schools.

Nukkad Natak: SHS is also planning to provide health education to school children on various health topics through Nukkad Natak.

Rolling Trophy: The SHS is planning to award a rolling trophy to one school health clinic every year on the basis of SHC's performance. The performance will include medical examination, OPD, TT immunization, Health Education, Punctuality, Innovative ideas, Initiatives for incorporating school health scheme with other Govt. schemes and other extra activities for the benefit of children undertaken by the clinic.

Involvement of National and International Agencies: Coordination with Department of education is required. The other health agencies which share the common health goals are as follows. Food and Nutrition Board, Bhartiya Kala Parishad, Delhi society for promotion of Rational use of Drugs, Disaster Management cell, National Institute of Health Promotion, National Institute of Health Research, AIIMS, MAMC, IHBAS, WHO, Unicef, Red Cross, and others (Fire Brigade, St. John Ambulance, etc.).

Help Line: School health scheme plans to launch a 24 hour help line number to reach out to the children and any other beneficiary. E-MAIL: an e-mail Id has already been created to share the queries and ideas of students and school authorities which is jdshshq@gmail.com.

School Health Services provided by MCD

1. *Preventive and promotive services:* (a) general medical checkup for early detection of defects and diseases, (b) eye and dental checkup (c) health education (d) counseling, and (e) maintenance of records.
2. *Curative services:* (a) school clinics for treatment of minor ailments, referral and follow-up; (b) central clinics for diagnosis and treatment of direct and referral cases; and (c) special clinics for eye, ENT and dental diseases.
3. *Rehabilitative Services:* provision of free spectacles, hearing aids and free orthopedic appliances.

MCD covering 9 lakh school children through 12 zonal units called central health clinics with 66 teams. Each team consists of one doctor and one public health nurse who have a weekly Program of visits. In each of the MCD schools there is a provision of a medicine bank. One zonal unit/Central Clinic consists of multi-specialty OPD in medicine, pediatrics, Eye, ENT, and dental health; routine laboratory investigation facilities, and distribution of spectacles and hearing aids. On the instructions of government of Delhi the MCD also organizes special programs like screening by paramedical staff and mass de-warming of all school children (MCD 2000).

In the MCD headquarter there is one in-charge school health, one deputy director in- charge, one dental surgeon, one personal assistant, UDC, LDC, Pharmacist/store keeper, peons, drivers and ward boy.

School Health Services Provided by New Delhi Municipal Corporation (NDMC)

NDMC covers 8 zones. Each zone has 10-15 schools and a main clinic. The main clinic has medical officer, pharmacist, staff nurse, and class-IV employees.

Table 34.1. Agency-wise distribution of school in Delhi

Agency	Schools
MCD	2119
Govt. of NCT Delhi	975
NDMC	95
Delhi Cantonment Board	6
Private/Other Agencies	500

Note: MCD covers all primary schools including nursery schools also and Delhi government covers middle and higher secondary schools whereas NDMC covers all levels of schools.

Central Government Scheme

Central government sanctioned Rs 383 Crore for 2012-13 for setting up of 2414 dedicated teams at block level to conduct the school health program under the NRHM to detect 3Ds-deficiency, disease and disability among children of age group of 6-18 years in 11 lakh government run institutions across 15 states. SHP will undertake biannual health service provision through screening, healthcare and referral to llok for anemia and assess the nutritional status of children, beside testing their visual acuity and hearing skills. Dental checkup, common skin diseases, heart defects, physical disabilities, learning disorders and behavioral problems will also be assessed. Basic medicine kit to take care of common school going children and referral for service connectivity from primary till superspeciality health facilities will be undertaken. Supplementation like fixed day immunization, micronutrient (Vit A and IFA), weekly supervised ingestion of iron folate tablets, administration of vit A and deworming will also be conducted. Health clubs and health cabinets will be introduced in government and government aided schools. First aid room, corners and clinics with support of education department attended by trained staff and connectivity with public health infrastructure will be established beside promotion of physical activities.

COMMENTS

1. There is no political will for this program till 2012 October when Union Minister of Health & Family Welfare declared the sanctioned of fund. Even such commitement is not enough to be claimed good political will.
2. This is not a priority issue for health planners, however, it has been observed that school health program is a cost-effective intervention.
3. The responsibility of school health was given to PHC staff who considered it as an extra burden. Program was never taken seriously by them because there was no monitoring. Health staff was also not trained to handle problems of adolescents and school students.
4. Actions required for this program: a) Joint (health & Education) training; b) joint visits by supervisors by both departments; c) visiting of every school in her/his area by every rural health workers for at least one half every month for conducting school health activities jointly with teachers; d) providing required drugs and material in every school; e) establishing a working referral system.

Job charts of the health functionaries should be written (Prasad 2005).

Children not attending schools -street children, working children, should be covered by special programs.

References

Aggarwal OP, Chaturvedi S. Structural and organizational Features of School Health Schemes in Delhi. IJP 2000; 67(3): 185-88.

Allensworth D, Wyche J, Lawson E, Nicholson L. Defining a Comprehensive School Health Program: An Interim Statement. Institute of Medicine. National Academy Press, Washington DC. 1995.

GOI. Report of the School health committee-Part I & II. Ministry of Health, Government of India, New Delhi.

Govt of India. Guidelines of the School Health Programme. MoHFW, Govt of India 2016. Available at http://www.mohfw.nic.in/index1.php? lang=1 &level=2 &sub linkid= 667 &lid=658

Govt. of NCT Delhi 2004. Annual Report (2002-2003), Directorate of Health Services, New Delhi-32.

Harriss B. Child nutrition and poverty in south India: A study of non meal scheme in Tamil Nadu. New Delhi, Concept Publishing Company 1991, pp.101.

Irwin LW, Humphrey JH, Johnson WR. Methods and Materials in School health education. St. Louis: The CV Mosby Company 1956.

Kirby D, et al. School-based programs to reduce sexual risk behaviors: review of effectiveness. Public health reports 1994; 109:339-360.

Kishore J. Rationality of Investment in School Health. Rationalist Voice 2002, Jan-March.

Lal S. Health and development of school children. IJCM 1998; 23:3-6.

Lal S. Reaching adolescent for health and development. IJCM 2001; 26: 167-272.

Levinger B. Nutrition, Health and education for all. Newton, MA, Education Development Center and United Nations Development Program, 1994.

MCD. Annual report of health department for year 2000. Bureau of Health Intelligence, Department of Health, Municipal Corporation of Delhi.

Nagarajan BS, Narayanasamy N, Dhandapani R. The noon meal scheme-A social measure with pediatric priority. Gandhi Gram Rural University, Gandhi Gram, Tamil Nadi 1982.

Nelson G, Cross F, Kolbe L. Evaluation of the teenage health teaching modules: overview: In: Ross JG, Nelson GD, Kolbe LJ eds. A Special insert: teenage health teaching modules evaluation. Journal of school health 1991; 61(1): 19-42.

Perry C. Expert review of school drug abuse education programs. Journal of school health 1986; 56:356-363.

Prasad KR. School health. Indian J Com Med 2005; 30: 109-110.

Prasad KR. School Health. IJCom Med 2005-10-2005-12; 30.

Rama V. Baru. School health services in India: The social and economic contexts. New Delhi. SAGE Publications. 2008.

Rowe DE. Healthful school living: environment health in the school. In: Allensworth DD, Kolbe LJ, eds. The comprehensive school health Program: exploring an expanded concept. Journal of school health 1987; 57 (10): 426-431.

Schultz EW, et al. School climate: psychological health and well-being in school. In: Allensworth DD, Kolbe LJ, eds. The comprehensive school health Program: exploring an expanded concept. Journal of school health 1987; 57 (10): 432-436.

Thangraj M. Impact of noon meal scheme on enrolment and retention: Case study. Social Welfare 2002; 48 (10): 15-20.

UN. World demographic estimates and projections, 1995-2025. New York, United Nation 1988.

UNICEF. The state of the world's children 1988. New York, Oxford University Press.

UNICEF. The state of the world's children 1995. Oxford: Oxford University Press.

WHO Expert Committee on School Health Services. Report on the first session. Geneva, WHO 1950 (WHO TRS No. 30).

WHO. Promoting health through schools. Expert Committee on Comprehensive School Health Education and Promotion. Geneva, WHO 1997 (WHO TRS No. 870).

Yadappanavar AV. Factor influencing elementary schools: Case Study. Social Welfare 2002; 48 (10): 10-14.

CHAPTER 35

NATIONAL PROGRAM FOR PREVENTION AND CONTROL OF FLUOROSIS

Fluorosis is a public health problem caused by excess intake of fluorides (>1.0 ppm) through drinking water/ food products/industrial pollutants, over a period of time. It results in major health disorders like dental fluorosis, skeletal fluorosis and non-skeletal fluorosis besides inducing ageing. These harmful effects, being permanent in nature and irreversible, are detrimental to the health of an individual and the community, which in turn has an impact on growth, development, economy and manpower of the country.

Prevalence of Dental fluorosis is about 16% and varies from 1.4% to 29.4% and the community fluorosis index is about 0.27. The prevalence of dental fluorosis is found higher in children who consumed pipe water as compared to children who consumed ground water. 65% of the children with dental fluorosis have no caries, i.e., fluoride protect from caries. Dental fluorosis can be attributed to the level of fluoride in the drinking water. Measures for defluoridation of drinking water before distribution has to be taken in the high prevalence areas to lower the burden of dental fluorosis in this community

Fluoride endemicity has been reported in 196 districts of 19 states and UTs of the country. The affected population with fluorosis is about 66 million in the country. As there is no effective treatment for the fluoride related disorders, prevention is the most effective measures for the same.

The chairman of National Human Rights Commission reviewed the fluorosis situation in the country and recommended a national program for the same. The Ministry of Health and Family Welfare has given assurance in the Parliament to look into the modalities of the National Program on Fluorosis. 11th Five Year Plan has emphasized the need and laid down framework for this program.

Goal

To prevent and control fluorosis in the country.

Objectives

- To assess the intake of fluoride by assessing its presence in all sources of drinking water, consumption of foods rich in fluoride and intake through industrial emissions at the districts in the endemic states.
- To coordinate the activities in relation to fluorosis being carried out in various departments/ministries like M/o Rural Development, D/o Drinking Water, Rajiv Gandhi National Drinking Water Mission, Education, Social Welfare, NICD, M/o H&FW.
- To Impart training to medical doctors and paramedics of the districts for early diagnosis.
- To develop IEC material from policy level to the community personnel.

In the beginning the program for prevention and control of Fluorosis can be implemented in 5 districts selected

from each of the 5 zones of the country. The program will be expanded to cover about 100 districts of 19 states depending on available resources.

Strategies

- Conducting fluoride survey regarding fluoride level in all drinking water sources, food product sources, industrial emissions if there is industry in the project district.
- Launching of extensive fluorosis prevention and control program in coordination with department of drinking water, Ministry of Environment, Ministry of Information and Broadcasting, Ministry of Social Justice and Empowerment and Ministry of Health and Family Welfare.
- Establishment of testing of fluoride facility in water, food and blood in each district of program areas.
- Imparting training program to medical and paramedics of the program districts to diagnose fluorosis cases including deformity cases.
- To develop extensive IEC materials in relation to fluorosis.
- To implement the decision of central program implementation committee under DGHS.

Activities at various levels

- *Village Level:* The existing AWW/ASHA/Village health guide/panchayat functionary will be involved in the implementation of the program. The appropriate training for fluorosis prevention and control will be imparted to the functionaries.
- *Subcenter Level:* both male and female MPWs and Mukhyasevikas of ICDS will be trained in the program.
- *Primary Health Center Level:* The existing medical officer, male and female health assistants of PHC and ICDS supervisory staff will supervise the sub-center and village level functionaries.
- *Community Health Center Level:* the existing medical and paramedical staff of the CHC, staff members of block development committee (BDC) and ICDS officer will be trained in proper supervision and implementation of the fluorosis prevention and control program.
- *District Level:* the CMO of the district will be responsible for the program.
- *State Level:* the DHS of the state will be implementing authority of this program.
- *Central Level:* the DGHS of Ministry of Health and Family Welfare will be nodal authority for advising, monitoring, technical and financial guidance at the national level.

Achievements

The National Program for prevention and control of fluorosis has been initiated in 6 districts and further expanded in 19 districts. Workshops are organized for development of guidelines for surveillance at the community level and training of both medical and paramedical staff for diagnosis and management.

COMMENTS

Design of the program is similar to any government run program and lacking community participation in implementation and planning at the community level.

Reference

Baskaradoss JK, Clement RB, Narayanan A. Prevalence of dental fluorosis and associated risk factors in 11-15 year old school children of Kanyakumari District, Tamilnadu, India: A cross sectional survey. Indian J Dental Research 2008; 9 (4): 297-303.

Govt. of India. Annual report 2009-10. Ministry of Health & family welfare, Govt. of India New Delhi.

CHAPTER 36

BASIC MINIMUM SERVICE PROGRAM

The Minimum Needs Program was started in fifth five year program of government of India with the objectives to provide certain basic minimum needs and thereby improve the living standards of the people in terms of social and economic development of the community particularly the underprivileged and underserved population. Initially, there were eight components of Minimum Needs Program, viz elementary education, rural health, rural water supply, rural electrification, rural roads, rural housing, environmental improvement of urban slums and nutrition. While adult education was added to the list of MNP components in the Sixth Plan, rural domestic energy, rural sanitation and public distribution system were added during the seventh Plan.

In spite of major efforts made in this direction, the achievement were below acceptable levels and not uniform in all sections of the society. In 1996, a bold initiative was taken in the Chief Ministers Conference to ensure Basic Minimum Services in a time bound manner. The Seven Basic Services identified for priority attention are:

1. 100% coverage of provision of safe drinking water in rural and urban areas; Elementary Education and Adult Education
2. 100% coverage of primary health services facilities in Rural & Urban Areas;
3. Universalization of Primary Education;
4. Provision of Public Housing Assistance to all shelterless poor families;
5. Extension of Mid-Day Meal Program in primary schools, to all rural blocks and urban slums and disadvantage sections;
6. Provision of connectivity to all unconnected villages and habitants; and
7. Streamlining of the public distribution system with focus upon the poor.

Primary Health Service

The primary health care infrastructure provides the integrated promotive, preventive, curative and rehabilitative services to the populations close to their residence. It is estimated that 80% of the health care need can be met by primary health care infrastructure and rest 20% is left for secondary and tertiary health care institutions. Strengthening primary health care infrastructure is going to be beneficial by reducing the cost and time of secondary and tertiary health care system because majority would be handled there only. Health facilities available in India is given in Table 29.1

Rural Primary Health Care

Delivery of health & family welfare services to rural community through three tier system was adopted - sub-center, primary health center and community health center. Primary Health Care Institution in Rural Health are:

Population Norms

Center	Plain	Hilly/Tribal Areas
Subcenter	5,000	3,000
PHC	30,000	20,000
CHC	120,000	80,000

Sub-center: It is manned by one Multipurpose worker (MPW) male and one female (MPW female/ ANM). There are 144988 subcenters functioning in the country (2006). Some are funded by Min. of Health & Family Welfare and some by state governments. Subcenter function as the most peripheral health institution of the government to provide preventive, promotive and curative health services to the population. Under Basic Minimum Services, State can open new subcenters and give salaries to ANM/Health worker female, rent, contingencies and medicines (Table 36.1).

Table 36.1: Health facilities in India

	Facility	Population Norm	Status
1.	Subcenter	1/5000	-
	(in Hilly/Tribal)	1/3000	-
2.	PHC	1/30,000	-
	(in Hilly/Tribal)	1/20,000	-
3.	CHC/Upgraded PHC	1/1 lakh	-
	(in Hilly/tribal)	1/80000	-
4.	Doctors	1/3500	1/2439 (1993)
5.	Nurse/Mid wife	1/5000	1/6172 (1993)
6.	Hospital	—	13692 (1997)
7.	Bed per lakh population	—	70
8.	Trained Dai	1/1000	601261
9.	Village Health Guide	1/1000	323208
10.	Average No. of SCs per PHC	—	5.68
11.	Average No. of PHCs per CHC	—	8.48
12.	No. of Hospitals		15393 (2003)
13.	Beds per lakh populations		89 (2003)
14.	Bed Density /100 population		0.78
15.	Subcenters		144988 (2005)
16.	Primary Health Centers		22669 (2005)
17.	Community Health Centers		3910 (2005)
18.	No. of Doctors per lakh population		70 (2005)
19.	No. of Dentists per million pop		45 (2005)
20.	No. of AYUSH Doctors		725238 (2007)
21.	No. of Nurses ANM		527482 (2007)
22.	No. of Nurses GNM		930526 (2007)
23.	No. of Nurses LHV		51186 (2007)
24.	No. of Pharmacists		681692 (2007)

Primary health center (PHC) : PHC is the first contact point between villagers and the medical officer. It is manned by a medical office (MO), supported by 14 paramedical and other staff. It acts as a referral unit for 6 sub-centers. It has 4-6 beds for patients. Its activities are curative, preventive, promotive and family welfare services. It is mainly established and maintained by the state government. In 2006, there were 22,669 PHCs functioning in the country.

Community Health Center (CHC): It is manned by four medical specialists i.e., surgeon, physician, gynecologist and pediatrician supported by 21 paramedical and other staff. It has 30 indoor beds with one Operation Theatre, X-rays, labor room, and laboratory facilities. It serves as a referral center for 4 PHCs. It is funded by the state government under Basic Minimum services Program/Minimum Need Program. As in 2006, there are 3910 CHCs functioning in the country (Table 36.1).

Rural hospital and dispensaries have to be restructured and interstate and intrastate disparities in health care according to 10th Plan. Initiatives to provide quality service and social safety through Social Safety Net Programs.

Urban Primary Health Care

The Ninth plan has aimed under this program to have well-structured organization of urban primary health care aimed at providing basic health and family welfare services to the population within 1-2 Kilometers of their dwellings. One Health & Family Welfare Post to cover 10,000 to 15,000 population manned by an ANM and one male multipurpose workers with a helper is also planned. Urban H & FW center should cater to about 1-1.5 lac population manned by 2 medical officers with other supporting staff.

Universalization of Primary Education

83.4% of the habitants in the country were served by a primary school within 1 km. of walking distance according to Sixth All India Education Survey. State and Center both are committed to provide education for all. The centrally sponsored schemes of operation blackboard, Non-Formal Education, teachers training and District Primary Education Project supplement are the examples of efforts made in this direction.

Safe Drinking Water for All

Despite the government best efforts, diarrhea remains

the major cause of death amongst children, after respiratory tract infections. I tis mainly due to poor sanitation and unsafe water supply. Access to protected sources of drinking water has improved dramatically over the years. Most rural water supply systems, especially the hand-pumps generally used by the poor, are using groundwater which is not safe in all places. In some places excessive arsenic and fluoride existed. Government of India under this program has declared safe drinking water for all.
Existing Norms for safe water supply are:

Rural Areas	:	40 Liters per capita per day (LPCD) within 1.6Km or 100 mtr elevation
Rural Area with cattle	:	30 Liters extra
Urban with piped water having sewage	:	125 LPCD
Urban without sewage	:	70 LPCD
Urban with spot source	:	40 LCPD
One spot source	:	20 families within 100 meters distance

Nutrition

For nutritional supplement two major Programs are run by the central government- Special Nutrition Program, a component of ICDS and the Midday Meal Program. National Nutrition Program for Girls has been started under the Department of Women and Child Development in which 6kg of grains are given to adolescent girls who are weighing less than 35 kg and pregnant women who are weighing less than 45 kg and they are below poverty line.

Housing

By 1997 the total housing shortages in the country was estimated to be 13.66 million units, out of which 7.57 million units would be in the urban areas. More than 90% of this shortage is for the poor and the low-income category. It was further estimated that Rs.2,50,000 crores shall be required for urban infrastructure during the Ninth Plan, but not more than 10% would be available from government sources. Therefore massive participation of the private sector is requested.

The government through a National Agenda declared HOUSING FOR ALL as a priority area and has set a target of construction of 2 million houses every year with emphasis on the poor and deprived, out of which 0.7 million houses shall be constructed in the urban areas. The New National Housing and Habitat Policy (NHHP) formulated in 1998. The Housing and Habitat Policy 1998 mainly aimed to create surplus cost effective housing with providing liberal legal, financial and administrative support, using efficient modern technology especially for the vulnerable groups and poor. It is also advocating empowering the PRIs and village cooperatives to mobilize credit for adding to the housing stock. However, not much emphasis is given on quality of housing suitable for health of people and environment.

Rural Connectivity

In the five year plan, the target is to ensure that 85% of the village population (not 85% of the villages) is connected by all weather roads.

Public Distribution System

The public distribution system has been an important part of the government strategy for ensuring food security. A recent initiative, the **targeted PDS** (TPDS) was introduced in 1997 where 10 Kg of food grains are to be issued per month to every Below-Poverty Line family at highly subsidized rates (40% of total cost) and to some subsidies to above poverty line (80% of the total cost).

Common Minimum Program

The United Front Government had brought out a document titled 'A Common Approach to Major Policy Matters and a Minimum Program' commonly known as Common Minimum Program (CMP) as their manifesto and agenda for action. The document contains an outline of the basic approach of the Government towards various socioeconomic and political issues. In pursuance of the same, action had been initiated by the concerned Ministries. The Department of program Implementation is the nodal Department to monitor the CMP.

Meetings have been held with the concerned Ministries/ Departments of the Govt. of India and action points have been identified to operationalize the CMP. The progress of implementation of the CMP is being reviewed from time to time. A few items such as restoring democratic rights to the State of Jammu & Kashmir and introducing a Bill on electoral reforms have already been successfully implemented. The discretionary quotas of Ministers have been withdrawn. A number of socioeconomic issues outlined in the CMP

have been emphasized in the Approach Paper to the IX Five Year Plan. The government accepted the Basic Minimum Services as the part of CMP.

COMMENTS

1. Targeted Public Distribution System is one the most important program to reduce the impact of poverty. However, it is documented that 36% of the wheat, 31% of rice and 23% sugar of TPDS is diverted from the system at the national level due to wide spread corruption, weak monitoring, lack of transparency and poor accountability (Hindu 2001).
2. It is also reported that the poor are charged more than 10%-14% of the official price for food grains. They are force to buy the food grains in bulk that limit their capacity to buy due to lack of money available in their pocket.
3. Mere planning of health action is not going to solve the problem of the country. Seriousness in the implementation of Program must be emphasized. Expenditure on various Program must be made public every year.

Revised Twenty Point Program 2006-2011

Twenty point program initiated by Hon'ble Late Prime Minister Smt. Indira Gandhi has served as a centralized vehicle for the social and economic development of the poor and weaker sections of the society. Revised program had following achievement:

1. Garibi Hatao (Poverty Eradication): 157498 lakh jobs cards issued and 888.92 crore mandays of employment generated under MGNREGA.
2. Kisan Mitra (Support to farmers): 502170 hectares of waste land developed and distributed to rural landless. More than 9.9 crore Kisan credit cards issued.
3. Subke Liye Aawas (Housing for all): 9817900 houses have been constructed for rural population under Indira Aawas Yojana. 440526 houses constructed for UG/EWS in urban areas.
4. Shudha Peya Jal (Clean Drinking Water): Under Accelerated Rural Water Supply Program, 3.38 lakh slipped back habitations with water quality problems addressed.
5. Jan Jan ka Swastha (Health for all): 486.51 lakh individual household latrines constructed in rural areas under Sanitation Program in Rural areas. 4.07 lakh HIV/AIDS registered persons currently receiving free anti-retroviral treatment. 8.06 lakh accredited social health activists (ASHAs) and link workers given training under NRHM.
6. Subke Liye Shiksha (Education for all): Under Sarve Shiksha Abhiyan 99% of the rural population has a primary school within 1 km.
7. Bal Kalyan (Child Welfare) number of functional ICDS Blocks risen to 6759.
8. Basti Sudhar (Improvement of Slums): 9.84 lakh urban poor families assisted under seven point charter.
9. Paryavaran Sanrakshan evam Van Vridhi (Environment Protection and Afforestation): 6561043 lectares of public and forest land brought under tree plantation.
10. Gramin Sadak (Rural Roads): 208084 Kms of rural road constructed under "Pradhan Mantri Gram Sadak Yojana"
11. Grameen Oorja (Energization of rural areas): 98176 villages electrified under Rajiv Gandhi Grameen Vidyutikaran Yoajan. 1475565 Pumps sets energized. Electric supply improved to 773489 million units.
12. Skilled training of urban poor people for employment.
13. Micro and Minor Irrigation.
14. More Agriculture storage capacity was created.
15. Upgradation of backward regions are carried out.

References

Planning Commission. Tenth Five Year Plan (2002-07) Vol II: Sectoral Policies and programs (Health). Planning Commission, Govt. of India New Delhi.

Unicef. Mapping India's Children: Unicef in Action. New Delhi: Unicef 2003.

Ministry of Statistics and Program implementation, Govt. of India. Time of India. 2nd October 2011.

CHAPTER 37

INDIA POPULATION PROJECTS (IPP)

INDIA POPULATION PROJECT-VIII

One of the aims of Delhi government is to provide maternal and child health and family welfare in the neglected areas like slums and Jhuggis Jhonpadis (JJ) clusters. IPP-VIII was a five years project started in 1993, which was extended up to 2001 with the assistant of World Bank and implemented by Municipal Corporation of Delhi (MCD). That project had covered a population of 12.5 lac staying in 929 JJ clusters of Delhi, through its 512 workers and 625 Basti Sevikas and equal number of trained dais.

Goals

Goals of IPP-VIII were to achieve "health for all by 2000AD" and to achieve NRR of 1 by 2000AD.

Strategy

Increase MCH services; Improve the quality of MCH services through training of health staff, mothers and other women groups; Improve utilization of services by generating community participation; and Improve socioeconomic status of women;

Targets of project-VIII

- Couple Protection Rate: 60% effective protection;
- 100% Antenatal care, immunization: 100%, delivery by trained personnel, postnatal care.
- Birth Order: Reduction in 3rd and higher order births.

Health infrastructure

Health Post: It was the primary unit of service delivery situated just in the community taking care of 10,000 population with the help of 1 ANM, 5 Basti Sevikas and 5 trained Dais selected from the community. All family welfare services were provided through these posts. These workers have been trained in IPP-VIII training cell. Kits were provided to pregnant mothers themselves so that in home delivery they could be utilized efficiently.

Health Center: One center for 50,000 population was provided curative and family welfare services. Two medical officers along with one public health nurse (PHN) and two ANMs were posted on this center.

Maternity Home: To cater the population of 12.5 lac there were 6 maternity centers that provided services of laboratories, and specialists to conduct normal and high risk pregnancies. MTP and terminal methods of family planning were also carried out in maternity homes.

Under this project there was a scope of research and development in the area of improvement of women skills, education (in collaboration with National Literacy Mission), awareness on environmental sanitation, nutrition, detection of breast and cervical cancers. These objectives were achieved through training,

Information Education Communication (IEC) activities, and Management Information System (MIS).

INDIA POPULATION PROJECT -IX

The World bank assisted IPP-IX Project was being implemented in the entire state of Assam, 10 backward districts of Rajasthan and 13 backward districts of Karnataka. The project has ended in 2001.

Aims

1. Improving health and family welfare services to the rural population
2. Training and program management
3. Construction of residential quarters for medical and paramedical personnel at Subcenters, PHC, and training institutions.

Under this project 4844 new buildings were constructed and 2280 buildings were renovated. 1.86 lacs of medical, paramedical and other personnel were trained. The World Bank has found the project satisfactory.

Area projects which were funded by world bank are absorbed in RCH-II. This division is also handling the components of "Vulnerable Group RCH" under the RCH-II program. This vulnerable group comprise of urban slum population, tribal population and general vulnerable groups and poor people living outside urban slums and notified tribal areas.

CHAPTER 38

POVERTY ALLEVIATION PROGRAMS

Poverty is defined as "a human condition, characterized by the sustained or chronic deprivation of the resources, capabilities, choices, security and power necessary for the enjoyment of an adequate standard of living and other civil, cultural, economic, political and social rights" (UN 2001). Poverty could be absolute and relative. Poverty has been defined as an inability to gratify the physiological needs, that is, need for survival, safety, and security. These physiological needs are different from the social needs, the need for autonomy, need for independence and the need for self actualization. The minimum requirements for fulfilling the physiological needs are food and nutrition, shelter, and preventive and protective health care. This requires 'minimum' income to buy necessaries and avail of facilities. Poverty is perceived in terms of 'poverty line' which is determined by the prevailing standards of what is needed for health, efficiency, nurturing of children, social participation, and the maintenance of self-respect. Usually the poverty line is drawn on the basis of a barest minimum desirable nutritional standard of calorie intake.

The Planning Commission in 1977 constituted a task force on projection of Minimum needs and Effective Consumption Demand, which submitted its report in 1979. The task force defined poverty lines as per capita consumption expenditure level, which meets the average per capita (adult) daily calories requirement of 2400 for rural and 2100 calorie for urban areas. On the basis of NSS data (1973-74) the poverty line was estimated at Rs. 49.09 per capita per month for rural and Rs. 56.64 per capita per month for urban areas. In 2010, the World Bank reported that 32.7% of the total Indian people fall below the international poverty line of US$ 1.25 per day (PPP) while 68.7% live on less than US$ 2 per day (World Bank). India's per capita income (nominal) is $ 1219, ranked 142nd in the world, while its per capita purchasing power parity (PPP) of US $3,608 is ranked 129th (IMF). Statewise poverty line is given in table 38.1.

There is almost one third of the population below poverty line which is at a higher risk of communicable and noncommunicable diseases resulting heavy mortality. Poverty is a significant factor needs to be removed for overall development of the population. The foremost reasons for poverty in India as perceived by poor in India are: lack of employment schemes, lack of land possession, undernourishment, lack of housing, and lack of education that can be removed by providing employment schemes, food for work, health facilities, education, provision of communication facilities, provision of irrigation facilities, housing facilities, good public distribution system, transport, etc. Government in this direction of removing poverty has launched may schemes and programs (Srivastava et al. 2007).

Bharat Nirman

1. Safe drinking water to all uncovered habitation by 2012.

2. Target of 60 lakh additional houses for the poor achieved till 2009 and target of 1.2 crore houses by 2014 adopted.
3. Achieve 40% rural teledensity by the year 2014, ensure broadband to all 2.5 panchayats and set up of Bharat Nirman Seva Kendra at Panchyat level by 2012.
4. All villages that have a population of 1000 (500 in hills and tribal) should have all weather road by 2012.
5. Reaching electricity to all villages and offcer electricity connection to 1.75 crore poor household by 2012.
6. Bring additional one crore hecture of land under irrigation by 2012.

Table 38.1: State specific Poverty Lines for 2011-12

State	Monthly per capita (Rs.)	
	RURAL	URBAN
Andhra Pradesh	860	1,009
Arunachal Pradesh	930	1,060
Assam	828	1,008
Bihar 778	923	
Chhattisgarh	738	849
Delhi 1,145	1,134	
Goa 1,090	1,134	
Gujarat	932	1,152
Haryana	1,015	1,169
Himachal Pradesh	913	1,064
Jammu & Kashmir	891	988
Jharkhand	748	974
Karnataka	902	1,089
Kerala	1,018	987
Madhya Pradesh	771	897
Maharashtra	967	1,126
Manipur	1,118	1,170
Meghalaya	888	1,154
Mizoram	1,066	1,155
Nagaland	1,270	1,302
Odisha	695	861
Punjab	1,054	1,155
Rajasthan	905	1,002
Sikkim	930	1,226
Tamil Nadu	880	937
Tripura	798	920
Uttarakhand	880	1,082
Uttar Pradesh	768	941
West Bengal	783	981
Puducherry	1,301	1,309
All India	816	1,000

Note: Computed as per Tendulkar method on Mixed Reference Period (MRP)

SCHEMES FOR RURAL DEVELOPMENT

1. Mahatama Gandhi National Rural Employment Gaurantee Act: aims at enhancing the livelihood security of people in rural areas by guaranteeing hundred days of wage-employment in a financial year to a rural household whose adult members volunteer to do unskilled manual work.

2. National Rural Livelihood Mission

3. Pradhan Mantri Gram Sadak Yojana: (PMGSY) was launched on 25th December 2000 as a fully funded Centrally Sponsored Scheme to provide all weather road connectivity in rural areas of the country. The program envisages connecting all habitations with a population of 500 persons and above in the plain areas and 250 persons and above in hill States, the tribal and the desert areas. About 1.67 lakh Unconnected Habitations are eligible for coverage under the program. This involves construction of about 3.71 lakh km. of roads for New Connectivity and 3.68 lakh km. under upgradation

4. Indira Awas Yojana: Housing lays foundation for living with dignity for the rural poor by dispelling the gloom of being shelter-less.

5. National Social Assistance Program: The National Social Assistance Programme(NSAP) which came into effect from 15th August,1995 represents a significant step towards the fulfillment of the Directive Principles in Article 41 of the Constitution. The programme introduced a National Policy for Social Assistance for the poor and aims at ensuring minimum national standard for social assistance in addition to the benefits that states are currently providing or might provide in future. NSAP at present, comprises of Indira Gandhi National Old Age Pension Scheme (IGNOAPS), Indira Gandhi National Widow Pension Scheme (IGNWPS), Indira Gandhi National Disability Pension Scheme (IGNDPS), National Family Benefit Scheme (NFBS) and Annapurna.

6. Swaranjayanti Gram Swarozgar Yojana: Assisting the rural poor in self employment by encouraging group and cluster activities, providing skill development opportunities, credit linkages and subsidies and creation of marketing opportunities for products has been another major plank of the poverty alleviation schemes of the Government. Launched on 1st April 1999, Swaranjayanti Gram Swarozgar Yojana (SGSY) is an integrated scheme for providing opportunities of self employment to the rural poor. The assisted families (Swarozgaris) may be individuals or Groups (Self Help

Groups). However, the emphasis is on Group approach and also with particular emphasis on group formation by women and the weaker sections.

It has been conceived as a holistic programme of self employment and some of its salient features are

1. Organizing the rural poor into Self Help Groups (SHGs) through social mobilization.
2. Key activity and development of activity clusters.
3. Training and marketing support to the Swarozgaris.
4. Involvement of NGOs/ CBOs/ Animators in social mobilization and training and capacity building of Self Help Groups.

Swarnjayanti Gram Swarozgar Yojana (SGSY) has been restructured as National Rural Livelihoods Mission (NRLM) to implement it in a mission mode in a phased manner for targeted and time bound delivery of results.

The following are the salient features of NRLM:

1. Universal social mobilization through formation of SHGs. This will ensure that at least one member of each rural BPL household, preferably a woman member of the household, is brought under the Self Help Group (SHG) net.
2. Form strong Peoples Institutions, by setting up of setting up of federations of SHGs from village panchayat to district levels. These federations will not only provide voice and strength to its members, but will also handhold the SHGs through providing all kinds of support services.
3. Universal financial inclusion will be furthered through linking the SHGs, banks and other Financial Institutions for securing credit.
4. Focus on ensuring skilled wage employment for rural youth through placement linked skill development projects.

POVERTY ALLEVIATION SCHEMES

Govt. of India has launched many urban development schemes viz. Prime Minister's Integrated Urban Poverty Eradication Program (PM IUPEP), Development of Women and Children in Urban Areas (DWCUA), National Slum Development Program (NSDP), Low Cost Sanitation (LCS), Scheme of Infrastructure Development in Mega-Cities (IDC), Integrated Development of Small & Medium Towns (IDSMT), Environmental Improvement of Urban Slums (EIUS), Urban Basic Service (UBS), Urban Basic Service for the Poor (UBSP), Nehru Rozjar Yojana (NRY), Swarna Jayanti Shahari Rozgar Yojana (SJRY), Accelerated Urban Water Supply Program (AUWSP), etc. Though these schemes were designed to help the urban poor, it was the middle class who has benefited from the schemes. The two popular sanitation technologies-septic tank, and sewerage and both of which are costly. Urban poor can not afford either of the two. In addition to this there are political and administrative problems, corruption and inefficiency of the implementation of the Programs that keep disturbing the achievements.

THE ENVIRONMENT IMPROVEMENT IN URBAN SLUMS SCHEME

The scheme was introduced in 1972 as a centrally sponsored scheme but was transfer to state sector in 1974. The Program is to provide seven basic amenities to slum households, namely water supply, storm water drains, community baths and latrines, widening and pavement of existing pathways and streets lighting and other community facilities. The Program is integrated with the existing urban poverty alleviation schemes.

COMMUNITY RISK POOLING AND HEALTH INSURANCE

Poverty underlines the poor health status in the community. Poverty entails chronic undernourishment of especially the poor urban women and children; it implies negligible access to affordable and adequate housing and resultant consequences of overcrowding; it also underlines lack of access to affordable health care, and exclusion from the formal economic sector and from benefits of urban development. Specific poverty-driven conditions, such as child labor, sex trade, domestic violence and substance abuse, exploitation by unqualified providers, use of hazardous biomass fuels for cooking all that have direct health consequences, get exacerbated in poor living condition such as slum. Search for "livelihood" determines the

life of the urban poor. Poor households are more likely to send their children to work (rather than to school), to cut back on expenses. Health improvement efforts therefore are more effective if associated with livelihood improvement and local empowerment strategies and therefore the need for development of community based health insurance models managed by the poor.

Many poor households have also been found to be women-headed and difficulties in their legal status and discrimination often prevent them from being able to access sources of credit. Additionally, it often appears that the time and money costs of access to services are seen by women more as social barriers and less as economic barriers since women must often negotiate for money from the husbands and other family members (the "decision makers") to access services that require payment. Therefore, the need for initiating micro-credit and savings mechanism to encourage the women to save a part of their incomes to cater to the health and other needs of the family.

Fee-for-service is the focus of the for- profit private sector, which limits the ability of the poor to pay. Also, the large presence of non-government health care providers particularly in the urban areas makes it a cost efficient alternative for financing health care for the urban poor. Therefore, subsidizing the health care cost to the urban poor, while also giving them a choice of health care providers, through a managed health insurance scheme, linked with quality assurance and regulation of healthcare providers appears to be a viable alternative.

The National Urban Health Mission (NUHM) recognizes that state/city specific, community oriented, innovative and flexible insurance policies need to be developed. While the private insurance companies may be encouraged to bring in innovative insurance products, the Mission would strive to set up a risk pooling system where the Center, States and the local community would be partners. This would be done by resource sharing, facility empanelment and regulation of adherence to quality standards, establishing standard treatment protocols and costs, apart from encouraging various premium-financing mechanisms.

A. Community Risk Pooling Mechanism

The community risk pooling mechanism is based on the core belief that *saving for difficult and* unforeseen *situation* has to be encouraged as a habit. Many of the health programs have demonstrated the value and benefit of community risk pooling at a very small level in the form of community health fund. It saves households from immediate financial crisis at the time of a health emergency.

NUHM encourages setting up of **Mahila Arogya Samitis (MAS),** to act as the unit of user group as well as for designing and managing a need-based and affordable health insurance scheme. The savings account created by the MAS will primarily include the savings by the women constituting the MAS, the one-time Seed Money, and annual Performance Grant provided under the NUHM. The money may be spent on the members' family's unforeseen health expenditure needs and other activities like group meetings, mobilization for health camps, etc.

Government is promoting such community-based groups for enhanced community participation and empowerment in conjunction with the community structures created under various employment and poverty alleviation programs such as the Swarna Jayanti Shahari Rojgar Yojana (SJSRY), a scheme of the Ministry of Urban Development which seeks to provide employment to the urban poor. Under the Urban Self Employment Program (USEP) of the scheme there are provisions for Development of Women and Children in Urban Areas (DWCUA) groups of at least 10 urban poor women and Thrift Credit Groups (TCG), which may be set up by groups of women.

There is also provision for informal association of women living in mohalla, slums etc to form Neighborhood Groups (NHGs) under SJSRY who may later federate towards a more formal Neighborhood Committee (NHC). Such existing structures under SGSRY may also federate into the Mahila Arogya Samiti, (MAS) a community based federated group of around 20 to 100 households, depending upon the size and concentration of the slum population, with flexibility for state level adjustments, and responsible for health and hygiene behavior change

promotion and facilitating community risk pooling mechanism in their coverage area.

Each of the MAS may have 5-20 members with an elected Chairperson/ Secretary and other elected representative like Treasurer. The mobilization of the MAS may also be facilitated by a contracted agency/ NGO, working along with the USHA responsible for the area. The members of the MAS would be encouraged to pool an agreed amount (say Rs.10- 20 or more - per family, per month). The amount will be deposited in a savings bank account, managed by the MAS.

The MAS will spend its reserve pool to a household in their respective catchments to help meet out-of-pocket expenses due to any healthcare emergency in the family.
Additionally, it may spend on community meetings, mobilization for health camps, referral transportation, purchase of health care etc. The MAS will be provided with seed money of Rs. 25 per household covered (assuming one member per household) for initiating operations, opening of account, based on USHA certification.

B. Urban Health Insurance Model
Beside governmental, private and non-governmental healthcare providers are present in the urban areas which need to be used for delivering health services for poor and also protecting poor from the burden of high out-of pocket expenses on health through an insurance mechanism. This mechanism would also help regulating the price (through negotiated rates with the providers) and quality (through accreditation/ empanelment of providers).

The NUHM would promote an urban health insurance model which takes care of the cost for accessing health care for surgery and hospitalization needs for the urban population at reasonable cost and assured quality, while subsidizing the insurance premium for the urban slum and vulnerable population. Initially this project will be implemented in five metro cities on a pilot basis for covering all referral services (specialist care) under the Urban Health Insurance Model.

The UHI model would be a cashless model. Every urban family availing the health insurance would be issued a photo-identity card (Family Health Suraksha Card). The family would be free to go to any service provider among the public/ empanelled nongovernment health facility, under the scheme. The public or private service provider would be reimbursed by the insurer under the health insurance scheme.

Benefit package
The health conditions and diseases to be covered under the insurance scheme will include hospitalization/ surgical cases, including maternal and childhood conditions and illnesses. Coverage will include Inpatient treatment requiring hospitalization for more than 24 hours. It would include consultation, investigation and room charges and medicines and surgical/medical procedures. The surgical package may include all categories of complex and common surgeries including Onlay Bone Grafts in dentistry (OBG), General surgery, Gastroenterology, Orthopaedics, ENT, Cardiology including Bypass. Surgical care required on a day care basis will also be covered under the scheme.

The monetary coverage is up-to a maximum of Rs.50,000 per year per enrolled household (on a floater basis) for the above mentioned types of cases/ conditions. Hospitals covered under the scheme would include empanelled public and private providers.

Premium
The premium under the scheme may be decided by the ULB/district/state through a tendering process involving the insurance companies. NUHM commits a subsidy of a maximum of Rs.600 as central contribution, for subsidizing the premium for the urban slum population and other vulnerable groups. Additional cost of the subsidy (if premium quoted by insurance company is higher than Rs.600 per family) may be paid by the state/district/ULB and/or the beneficiaries themselves.

Each scheme would explore various premium-financing options, which may include but not be restricted to the following:
a. Linkage with other social protection schemes (like Mukhya Mantri Jeevan
   Raksha Kosh in Rajasthan, Jharkhand, etc.)
b. Soft loans (for annual premiums, loan by the MAS, cooperative banks, MFIs etc.)

c. Donors (bilateral/multilateral donors, industrial houses, state cooperatives, public sector undertakings, etc.)
d. Subsidy (by central, state governments, ULBs)
e. Health Savings Account (linking with savings/ interest earnings of MAS)

The National Urban Health Mission would commence as a 100% centrally Sponsored Scheme in the first year of its implementation during the XIth Plan period.

However, for the sustainability of the Mission from the second year, onward the sharing mechanism between the Central Government State/Urban local body would reduce to 85% and after 5 years to 75%.

Year	Central	State	Urban Local Body*
2008-09	100	0	0
2009-10	85	15	0
2010-11	85	10	5
2011 onward	85	10	5
Twelfth plan Onward	75	15	10

References

Govt. of India. India 2005. Ministry of Information and Broad Casting, Publication Division, New Delhi 2005.

Govt. of India. Urban Health Mission 2008. MOHFW NDelhi

Srivastava DK, Sanyal SK, Rao B, Chakraborty P. Rural poverty in Madhya Pradesh: Looking beyond conventional measures. economic and Political Weekly 2007; XLII (5):381- 388.

The Hindu. Plan panel puts poverty figures at higher level. 2000, May 17th

World Development Report 1992. Development and the environment. Oxford: Oxford University Press for the World Bank, 1992.

World Health Report 1998. The changing world. WHO 1998.

CHAPTER 39

PROGRAMS FOR WATER AND SANITATION

BURDEN OF PROBLEM

World

Drinking water and sanitation facilities are very important and crucial for achieving goal of "Health For All". The MDG drinking water target, which calls for halving the proportion of the population without sustainable access to safe drinking water between 1990 and 2015, was met in 2010, five years ahead of schedule. 2.6 billion gained access to improved sources of drinking water during this period. Despite progress, 2.4 billion are still using unimproved sanitation facilities, including 946 million people who are still practicing open defecation (WHO).

The proportion of the world's population with access to improved drinking water sources increased from 76% to 91% globally between 1990 and 2015, surpassing the MDG target. While coverage is near or above 90% in all developing regions of the world, with the exception of sub-Saharan Africa and Oceania, where the coverage are 68% and 56% respectively, widespread disparities exist between countries and across regions. There are also disparities between urban and rural coverage, where an estimated 96% of the urban population globally used an improved water supply source in 2015, compared to 84% of the rural population.

Sanitation has been considered as the most important medical advance since 1840 - beating antibiotics, vaccines, and anaesthesia.

There is compelling evidence that sanitation brings the single greatest return on investment of any development intervention (roughly $9 for every $1 spent).

Sustainable Development Goal 6 aims to ensure access to water and sanitation for all (SDGs). Its targets are:

1. By 2030, achieve universal and equitable access to safe and affordable drinking water for all
2. By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situation
3. By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally
4. By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity
5. By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate

6. By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes
7. By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies
8. Support and strengthen the participation of local communities in improving water and sanitation management

Access to sanitation goes hand in hand with human rights and human dignity. Contamination of food and water caused by sanitation problems undermines the right to food, and access to safe drinking water. Lack of access to toilets at school has been shown to lead to drop outs or non-enrolment of girls, impacting their right to education. Sanitation facilities are also considered a fundamental part of the right to adequate housing. More fundamentally, being forced to defecate in public is an affront to human dignity.

Diarrhoeal disease is the second leading cause of death in children under five years old, and is responsible for killing around 760 000 children every year (WHO Diarrheal Diseases). It is estimated that diarrhoea is causing approximately 1.3 million deaths among underfive children each year, mostly in developing countries (Black et al 2008). However, reported deaths are over 287,000 attributable to diarrhoeal diseases per year, India ranks first among countries contributing to this worldwide disease burden (Black et al 2008). India has only 11% of the rural population supplied by a household water connection. Faecal contamination of drinking water supplies is rampant. In a study it was found in Hyderabad that 50% of water samples and in Madhya Pradesh 33% of boreholes were positive for faecal coliforms (NEERI 2004).

In Sub-Saharan Africa, treating diarrhea related diseases costs an estimated 12 percent of national health budgets. With widespread disease and illness, the productivity of workers is drastically reduced, and children are absent from school. For the most part, it is poorest and most marginalized groups who suffer from the worst sanitation conditions. Infant deaths, lost workdays, and missed school are estimated to have an economic cost of around USD 38 billion per year (de Albuquerque 2008). Inadequate sanitation is impacting health and economies of countries in South-East Asia. Improving sanitation is the most effective way of reducing these losses. Every dollar spent on sanitation yields about US$ 9 in savings on treatment, health-care costs and gains from more productive days (WHO health and economic cost).

Approximately, 80-90% of untreated sewage is discharged directly into rivers and streams, the main source of water supply in cities (Tibbetts 2000). *Human feces remains one of the world's most dangerous pollutants,* spreading microbes that cause typhoid, cholera, diarrheal illness, amoebic dysentery, and other virulent disease (WHO 1999). As per the WHO estimate, 80% of all diseases in developing countries, including India, are related to unsafe drinking water and poor sanitation. Approximately, 6000 children die every week from water related disease. Diseases, the common cause of deaths are gastroenteritis, typhoid, cholera, hepatitis, amoebiasis, schistosomiasis, intestinal worm infestations, and vector borne diseases like guinea worm, yellow fever, malaria, etc. There are evidences that provision of adequate sanitation services, safe water supply, and hygiene education represents an effective health intervention that reduces the mortality caused by diarrheal diseases by an average of 65% and related morbidity by 26%.

In Delhi, for example, *the Coliform count in the city's main river, the Yamuna, increases 3000 fold from the time it enters the city to the time it leaves* (Hardoy et al 1992). That stretch of the river also receives about 20 million liters of industrial effluents. Diarrheal diseases are common in urban slums (Sircar et al 1984, Mandal et al 1990) however incidence reduced significantly if the safe drinking water supply is provided (Lal et al 1996). In India, there are 3119 larger cities only 209 have partial wastewater treatment plants. Not more than 10 have full treatment facilities.

Even today, cholera epidemics occur regularly in India. The cholera epidemic caused by a novel strain of Vibrio cholerae, designated as V. cholerae 0139 Bengal in 1992 and multidrug-resistant shigellosis in eastern India in 1984 are matters of grave concern. The launching of the National Diarrheal Diseases Control Program

(NDDCP) in 1978, based on a three-tier approach, is of great importance. The rate of use of oral rehydration salt (ORS) solution and oral rehydration therapy (ORT) remain suboptimal in India.

Even water that is safe at the point of distribution is contaminated during collection, transport, and storage (Wright et al 2004). Household water treatment and safe storage (HWTS), including boiling, chlorinating, and filtering water at home, can improve water quality at the point of delivery and prevent post-collection contamination. In some studies water quality after HWTS are found to be effective in improving drinking water quality and in preventing diarrhoea (Fewtrell et al 2005, Arnold et al 2007, Clasen et al 2006) but in other there was no evidence found (Jain et al 2010, Schmidt et al 2009, Boisson et al 2013).

In spite of the launching of the 'Ganga Action Plan' and the 'National River Action Plan', India faces a major problem of diarrheal diseases (Battacharya 2003).

Arsenic and Other metals Problem in India

The ground water in a huge alluvial tract along the river Hooghly covering a stretch of about 470 km., encompassing eight districts in the state of West Bengal (India) is affected by arsenic pollution of ground water. The probable source of arsenic has been reported to be through geological formations. Occurrence of iron-pyrite and the change of geochemical environment due to over-exploitation of ground water or excessive fluctuation of ground water table are the possible reasons of decomposition of pyrite to ferrous sulphate, ferric sulphate and sulphuric acid. However, no definite explanation regarding the source of arsenic could be established so far. Keeping in view the severity of the problem, an attempt has been made to bring out the nature and extent of arsenic problem in ground water of West Bengal, India, as well as need for watershed management to combat the situation.

High presence of arsenic, fluoride, chromium, iron, manganese, mercury, nickel and other metals in water sources in areas around the East Parej and North Karanpura coalfields leading to morbidity and mortality. A study by the Central Pollution Control Board and the Calcutta University has reported lead, cadmium and nickel in vegetables. Leafy vegetables like spinach grown in the area contained 101.5mg of lead per kilogram of produce. It has been estimated that 45 lakh to 60 lakh people are exposed to elevated arsenic concentration in drinking water in India (Fewtrell et al 2005). There is a need to enforce the concept of "universal right to safe water" and work globally to achieve this shared responsibility (Verma & Bansal 2007).

PROGRAMS

The Environmental Hygiene Committee (1948-49) appointed by the Union Government had recommended a comprehensive plan for providing safe water supply and sanitation to the population and thereafter the National Water Supply and Sanitation Program was launched in 1954. The UN declared 1980-1990 as the "International Drinking Water Supply and Sanitation Decade". The Targets were fixed by the Indian Government for the decade: 1. One hundred percent urban and rural water supply, 2. Fifty percent urban sanitation, 3. Twenty five percent rural sanitation. The Guinea worm eradication program was linked up with this decade. In 1986, the National Drinking Water Mission (NDWM), popularly known as the "Technical Mission" was launched in order to provide scientific and cost effective content to the Centrally Sponsored Accelerated Rural Water Supply Program. This was renamed as Rajiv Gandhi National Drinking Water Mission in 1991. In 1987 the National Water Policy was announced that has given high priority to drinking water. Rural Water and Sanitation was taken up by the Minimum Needs Program. In Ninth Plan the safe drinking water for all has been linked up with Basic Minimum Service Program which was previously known as Minimum Need Program.

In 1990, UN General Assembly accepted the following guideline given in the New Delhi Declaration for water supply and sanitation:

1. Protection of environment and safeguard of health through the integrated management of water resources and solid waste.
2. Organizational reforms, changing attitudes and behavior and full participation of women.
3. Community management of services, and strengthening local institutions.
4. Sound financial practices, and application of appropriate technology.

The program was augmented but over a period of time it has been realized that the targets can not be achieved. Global Water Supply & Sanitation Assessment report 2000 has specified several sector constraints:

1. Financial difficulties,
2. Institutional problems,
3. Inadequate human resources,
4. Lack of political commitment,
5. Lack of sector coordination,
6. Insufficient community involvement,
7. Inadequate operation and maintenance,
8. Lack of hygiene education,
9. Poor water supply, and
10. Insufficient information and communication.

NATIONAL RURAL DRINKING WATER PROGRAM

The NRDWP (erstwhile ARWSP) is one of the components of Bharat Nirman, which was conceived as a plan to be implemented in four years, from 2005–06 to 2008–09 for building rural infrastructure. During the Bharat Nirman Phase-I period, 55,067 uncovered habitations and about 3.31 lakh slipped-back habitations were to be covered and 2.17 lakh quality-affected habitations were to be addressed. Tackling arsenic and fluoride contamination had been given the first priority. In 1999, the first major sector reform project was started. In 2010, it was renamed as department of drinking water and sanitation under the Ministry of Rural Development and in 2011 it was conferred the Ministry of status and named the Ministry of Drinking Water and Sanitation.

Vision: Safe and adequate drinking water for all, at all times, in rural India (MDWS).

Objectives:

In rural areas of the country, to

a) enable all households have access to and use safe and adequate drinking water and within reasonable distance;
b) enable communities to monitor and keep surveillance on their drinking water sources;
c) ensure potability, reliability, sustainability, convenience, equity and consumers preference to be the guiding principles while planning for a community based water supply system;
d) provide drinking water facility, especially piped water supply, to Gram Panchayats that have achieved open defecation free status on priority basis;
e) ensure all government schools and anganwadis have access to safe drinking water;
f) provide enabling support and environment for Panchayat Raj Institutions and local communities to manage their own drinking water sources and systems in their villages;
g) provide access to information through online reporting mechanism with information placed in public domain to bring in transparency and informed decision making;

Goals – Strategic Plan (2011-2022)

The Ministry has prepared a Strategic Plan for the rural drinking water sector for the period 2011 to 2022. The Goal of the Strategic Plan is:

- To ensure, that every rural person has enough safe water for drinking, cooking and other domestic needs as well as livestock throughout the year including during natural disasters and,
- by 2022, every rural person in the country will have access to 70 lpcd within their household premises or at a horizontal or vertical distance of not more than 50 meters from their household without barriers of social or financial discrimination. Individual States can adopt higher quantity norms, such as 100 lpcd.

PARADIGM SIFT

- Water supply schemes designed to provide 40 lpcd for the entire population in a habitation not adequate.
- Need to move ahead from the conventional norms of litres per capita per day (lpcd) norms to ensure drinking water security for all in the community.
- It is important to ensure that the basic minimum requirement at the household level for drinking and cooking needs and also for other household needs and cattle are met.
- Water supply for drinking and cooking should maintain quality as per the prescribed as per BIS standards.
- To prevent contamination of drinking water in the conveyance system, it is advisable to adopt

24 x 7 supply where ever possible.

- Focus on personal hygiene, and proper storage at the house hold level.
- Need to establish quality assurance programs for water supplies to reduce the potential risk of contamination of water supply - 'Water Quality Monitoring & Surveillance Program'.
- Installation of a water supply system in a habitation does not confer on the habitation the status of a fully covered habitation unless every house hold in the habitation has been fully covered with potable water in sufficient quantity.
- To enable the community to plan, implement and manage their own water supply systems, the State should transfer the program to the PRIs particularly to the Gram Panchayats for management within the village.

Components of the NRDWP

- — Coverage for providing safe and adequate drinking water supply to unserved, partially served and slipped back habitations,
- — Sustainability to encourage states to achieve drinking water security at the local level,
- — Provide potable drinking water to water quality affected habitations
- — Desert development program (ddp) areas to tackle the extreme conditions of low rainfall and poor water availability,
- — Mitigate drinking water problems in rural areas in the wake of natural calamities
- — Operation & maintenance (o&m) for expenditure on running, repair and replacement costs of drinking water supply projects, and
- — Support activities.

In the rural context, drinking water is to be provided under NRDWP to every public place

- — School
- — Anganwadi
- — Public building
- — PRI office
- — Community halls
- — Markets
- — Temples
- — Religious institutions
- — Mela ground
- — Cremation ground
- — Provision of drinking water facilities will also address the needs of floating population by installing street stand posts at convenient locations.

Criteria for Allocation of Funds under NRDWP

- — Coverage -30 %
- — Water quality- 20%
- — Sustainability- 20%
- — O and M – 10%
- — Desert and drought prone areas- 5%
- — Natural calamity- 5%
- — Support- 5%

Funds in areas of SC/ST habitation

- — States/UTs are required to earmark at least 25% of the NRDWP funds for drinking water supply to the SC dominated habitations and a minimum of 10% for the ST dominated habitations. Where the percentage of SC or ST population in a particular State is high and warrants earmarking/utilization of more than the stipulated provisions, additional funds may be utilized.
- — The State Governments/UT Administration may separately monitor the status of assured availability of potable drinking water in SC/ ST habitations.

Current scenario

As against the target of 7,98,967 habitations for coverage under NRDWP during the Eleventh Plan, the coverage up to 31 March 2012 was 6,65,034. The difficulty has been that even as coverage becomes universal, there is a growing problem of 'slipback'. There is lack of convergence with sanitation with poor operation and maintenance. For the Eleventh Five Year Plan, it had been decided that the major issues which need tackling during this period are problems of sustainability, water availability and supply, poor water quality, centralized versus decentralized approaches and financing of O&M, cost on equitable basis with full consideration to ensure equality in regard to gender, socially and economically weaker sections of the society, school children, socially vulnerable groups such as pregnant and lactating mothers, specially disabled and senior citizens etc. For the Twelfth Plan period the Working Group on Domestic Water and Sanitation has recommended amongst others the following initiatives

(i) the need to increase drinking water supply service levels in rural areas from 40 lpcd (litres per capita per day) to 55 lpcd;

(ii) focus on piped water supply and
(iii) conjoint approach on drinking water supply and sanitation (MDWS).

New initiatives in the 12th Five Year Plan (Annual report 2014-15)

1. Ministry has constituted an expert Committee to advise the Ministry on Technological aspects of Drinking Water and Sanitation.
2. WASH week was celebrated across the country in the month of February 2014. This would be a permanent feature of the programme to be celebrated every year.
3. Indovation- August 2014 and Indovation – January, 2015 were organized by the Ministry. This is a unique platform provided by the Ministry for interaction and dissemination of developments of technologies in the water and sanitation sectors where all stakeholders in this sector meet and share knowledge/ experience for the benefit of all.
4. Guidelines for setting up of Community Water Purification Plants in rural areas of states have been issued in November, 2014.
5. In order to raise coverage of piped water supply, toilet coverage and strengthening of institutions and systems in rural drinking water and rural sanitation sectors, the Ministry has proposed a Rural Water Supply and Sanitation Project for low income States of Assam, Bihar, Jharkhand and Uttar Pradesh at an estimated cost of more than Rs.6000 crore for World Bank assistance of 50% of the project cost.
6. Waste water treatment and recycling to be an integral part of every water supply plan or project; bringing the concept of Renovation and Modernization (R & M) into the planning process;
7. Incentivize substantive devolution of functions, funds and functionaries to the Gram Panchayats with respect to rural water supply schemes, through a Management Devolution Index (MDI) with clear and specific indicators on the basis of which distribution amongst States of National allocation would be decided
8. In order to raise coverage of piped water supply, toilet coverage and strengthening of institutions and systems in rural drinking water and rural sanitation sectors, the Ministry has proposed a Rural Water Supply and Sanitation Project for low income States of Assam, Bihar, Jharkhand and Uttar Pradesh at an estimated cost of more than Rs.6000 crore for World Bank assistance of 50% of the project cost.
9. A Pilot project on taking up Drinking Water Security Planning through Integrated Water Resource Management and source sustainability measures on a participative basis has been taken up in 15 over-exploited Blocks of the country.
10. Focus on piped water supply rather than on hand pumps, so as to decrease the pressure on ground water extraction and also ensure potability of water, has been laid;
11. Enhancement of service levels for rural water supply from the norm of 40 lpcd to 55 lpcd for designing of systems;
12. Greater thrust on coverage of water quality affected habitations with earmarked funding for chemical contamination and Japanese Encephalitis / Acute Encephalitis Syndrome (JE / AES) affected areas;
13. Moving towards the target that, by 2017, at least 50 per cent of rural population in the country have access to 55 lpcd within their household premises or within 100 metres radius, with at least 30 per cent having individual household connections, as against 13 per cent today;
14. Incentivize substantive devolution of functions, funds and functionaries to the Gram Panchayats with respect to rural water supply schemes, through a Management Devolution Index (MDI) with clear and specific indicators on the basis of which distribution amongst States of National allocation would be decided;
15. All new drinking water supply schemes to be designed, estimated and implemented to take into account life cycle costs and not just per capita costs;
16. Participative planning and implementation of integrated water resource management practices through water budgeting and both supply side and demand side planning;
17. Earmarking of funds for coverage of SC and ST population concentrated habitations;

18. Incentive to ASHA workers for encouraging households to take household connections;
19. States have been asked to cover 20,000 Quality Affected Habitations by March,2017.

Water Quality Monitoring & Surveillance (WQM&S)
The National Rural Drinking Water Quality Monitoring & Surveillance Program was launched in February 2006 with the prime objective of institutionalization of community participation and involvement of PRIs for water quality monitoring & surveillance of all drinking water sources.

Water is defined as safe if it is free from biological contamination (guinea worm, cholera, typhoid etc.) and within permissible limits of chemical contamination (arsenic < 0.05 mg/l, fluoride < 1.5 mg/l, brackishness < 2000 mg/l, iron < 1 mg/l , nitrate 45 mg/l etc.)

There is a paradigm shift from 'just providing a water supply system in the village' to 'ensuring water supply security at the house hold level'. All drinking water sources should be tested at least twice a year for bacteriological contamination and once a year for chemical contamination. States may establish Water Testing Laboratories at the Sub- Division level with a provision of testing few selected chemical parameters (need based) and biological parameters. Under NRHM there is a provision of testing water quality (biological parameters) at the Primary Health Centers. Such facilities, along with any other labs like college/ school labs, in the area, may be used for the program. The services of five GP level persons who have been trained under National Rural Drinking Water Quality Monitoring & Surveillance program since February 2006 i.e. ASHA, Anganwadi Workers, School Teachers, GP members, Social Workers etc. will continue to be utilized for the surveillance program. For data collection at the household level and at the habitation level one person, preferably a woman member of VWSC may be nominated ("JAL SURAKSHAK") Since ASHA is also responsible for community action on prevention of water and sanitation –borne diseases the VWSC member selected should work in close coordination with ASHA.

The District / Sub-division Level Water Testing Laboratory must have facilities of testing the following parameters viz.

1. pH
2. Total Hardness
3. Iron
4. Chlorine demand
5. Residual Chlorine
6. Nitrate
7. Fluoride and Arsenic where ever it has been identified and detected
8. In addition to above tests there will be provision for bacteriological analysis of water to determine if there is any faecal contamination.

Nirmal Gram Puraskaar
It is started in 2003 by GoI to augment Total Sanitation campaign (TSC), by recognising the efforts of PRI and other institutions who have made efforts to implement total sanitation in their area of operation.

Objectives of NGP
- To promote safe sanitation and clean enviornment as a way of life in rural India.
- To incentivise PRIs to make villages Open defecation free and to adopt solid and liquid waste management.
- To sustain the initiative of clean environment.
- To encourage organizations to play a catalytic role in social mobilization in the implementation of NBA.

Eligibility for gram panchayats
- GP has adopted a resolution to ban open defecation within its entire area inclusive of all habitations and villages.
- All habitations within GP jurisdiction have access to water for drinking and sanitation purposes.
- GP has achieved objectives for all components as approved in the district project and entered it in the IMIS of the ministry.

TOTAL SANITATION CAMPAIGN
The goals included the catalyzing of the construction of:
- 120 million toilets at the household level
- 11.2 million toilets for schools
- 0.4 million toilets for child care centres
- 28,000 community level sanitary complexes
- 4,000 rural sanitary marts/production centres

Strategy

- — A "demand driven approach" is to be adopted with increased emphasis on awareness creation and demand generation for sanitary facilities in houses, schools and for cleaner environment.
- — Rural School Sanitation is a major component and an entry point for wider acceptance of sanitation by the rural people.
- — Subsidy for individual household latrine units has been replaced by incentive to the poorest of the poor households.
- — Technology improvisations to meet the customer preferences and location specific intensive IEC Campaign involving Panchayati Raj Institutions, Co operatives, Women Groups, Self Help Groups, NGOs etc.
- — The strategy addresses all sections of rural population to bring about the relevant behavioural changes for improved sanitation and hygiene practices and meet their sanitary hardware requirements in an affordable and accessible manner

Implementation

Implementation of TSC is proposed on a project mode. TSC is implemented in phases with start-up activities. Funds are made available for preliminary IEC work. Individual households choose from a menu of options for their household latrines.

In the "campaign approach" there is synergistic interaction between Government and other stakeholders. Intensive IEC activities are carried out. Participation of NGOs/PRIs/resource organizations is important. Unit of implementation is district. The States/ UTs are expected to prepare TSC Projects for all the districts and submit before the Government of India for sanction. The TSC Project cycle in the Project Districts is expected to take about 4 years or less for implementation.

Components

1. *Start Up Activities*
   The start up activities include conducting of preliminary survey. The start up activities will also include conducting a Baseline Survey (BLS), preparation of Project Implementation Plan (PIP), initial orientation and training of key program managers at the district level.
2. *IEC Activities*
   The activities carried out under these components should be area specific and should also involve all sections of the rural population, in a manner, where willingness of the people to construct latrines is generated. The IEC should also focus on health and hygiene practices and environmental sanitation aspects. Under IEC, mass media campaign should be taken up only at the national and state level and not at the district level. At district level, focus should be on inter personal communication, use of folk media and also outdoor media like wall painting, hoarding etc. The IEC plan should include a component for raising awareness among school going children, teachers etc.
3. *Rural Sanitary Marts (RSMs) and Production Centers*
   The Rural Sanitary Mart is an outlet dealing with the materials, hardware and designs required for the construction of not only sanitary latrines but also other sanitary facilities. It is a commercial venture with a social objective. The main aim of having a RSM is to provide materials, services and guidance needed for constructing different types of latrines and other sanitary facilities, which are technologically and financially suitable to the area. To meet the needs of remote and difficult areas, mini RSMs are permissible
4. *Provision of Revolving Fund in the District*
   Sum of upto Rs 50 Lakhs is permitted. Loan from this fund should be recovered in 12-18 instalments. District TSC projects will have the flexibility to decide the other terms and conditions for sanction of the revolving fund. Loan can also be given to the owner of the household where ICDS center is located for construction of baby friendly toilet for ICDS.
5. *Construction of Individual Household Latrines*
   A duly completed household sanitary latrine shall comprise of a Basic Low Cost Unit with a super structure. The unit cost of Individual Household Latrine (IHHL) under TSC is

Rs.2500.00 (Rs. 3000.00 for hilly and difficult areas). Houses constructed for BPL families under Indira Awas Yojana shall invariably be provided with a toilet.

6. *Community Sanitary Complex*
These Complexes, comprising an appropriate number of toilet seats, bathing cubicles, washing platforms, Wash basins etc, can be set up in a place in the village acceptable to women/men/ landless families and accessible to them.

7. *Institutional Toilets*
Children are more receptive to new ideas and schools/Anganwadis are appropriate institutions for changing the behaviour, mindset and habits of children from open defecation to the use of lavatory through motivation and education.

8. *Ecological Sanitation*
The ecological sanitation structure consists of specially designed toilet seat to separate urine and feaces at source. The urine is collected in a container while feces is deposited into a closed chamber under the toilet seat.

9. *Solid and Liquid Waste Management*
One of the objectives of TSC is bringing about an improvement in the general quality of life in rural areas. Thus Panchayati Raj Institutions (PRIs) are required to put in place mechanisms for garbage collection and disposal and for preventing water logging.

10. *Administrative Charges*
The administrative charges include money spent on training, salary of temporary staff deployed during project period, support services, fuel charges, vehicle hire charges, stationery, monitoring & evaluation of TSC project.

Current scenario

— The TSC has been able to accelerate sanitation coverage from 22 per cent as per the 2001 Census to 67 percent in 2011, with over 28,000 PRIs becoming 'Open Defecation Free' (ODF).

— The Twelfth Plan Working Group found that the APL–BPL distinction and the very low incentive under the TSC have played havoc with the program.

— Many slip-backs in the NGP villages have been attributed to non-availability of water, clearly indicating need to synergise the drinking water and sanitation programs.

New Initiatives (MRD):

- Assistance for School Toilet block increased from ' 20000/- to ' 35000/-(' 38500/-for Hilly and Difficult Areas)
- Assistance for Anganwadi Toilet increased from ' 5000/- to ' 8000/- (' 10000/-for Hilly and Difficult Areas)
- IEC Guidelines 2010 prepared for generating effective demand

Total Sanitation Campaign in the Twelfth Plan

— The goal of the Twelfth Plan will be that 50 per cent of the Gram Panchayats attain Nirmal Gram status by the year 2017.

— The APL–BPL distinction and the focus on individual toilets are to be replaced by a habitation saturation approach.

— Through a convergence with MGNREGA, the unit cost of individual household latrines will rise to Rs10,000.

— In order to focus more centrally on sustainability of outcomes, the program shall be taken up in a phased manner wherein GPs shall be identified, based on defined criteria of conjoint approach to sanitation and water supply, for achievement of NGP status. This would progressively lead to Nirmal blocks, Nirmal districts and eventually Nirmal States.

— A new strategy will be devised to facilitate convergence between drinking water and sanitation projects.

— NBA will give priority to coverage of areas with functional piped water supply systems (PWSS).

— Running water availability must also be ensured in all Government school toilets, anganwadi toilets and Community Sanitary Complexes

— In order to ensure smooth O&M of toilets, a massive training campaign will be launched.

— IEC Activities

— Solid and liquid waste management will be taken up in Nirmal Grams on a priority basis for which an assistance of Rs 5,00,000 will be additionally available per 1,000 people.

Water supply in urban areas

Current scenario

Water Supply

- As per 54th round of NSS, 70% of urban households reported being served by tap and 21% by tubewell or hand pump.
- 66% of urban households reported having their principal source of water within their premises while 32% had it within 0.2 km.
- 41% had sole access to their principal source of drinking water and 59% were sharing a public source
- As per 2011 census 70.6 per cent of urban population is covered by individual connections, compared with 91 per cent in China, 86 per cent in South Africa and 80 per cent in Brazil.

Sewerage

- 54th round of NSS reported 26% of households having no latrines, 35% using septic tank, and 22% using sewerage system.
- As per 2011 census, about 13 per cent of urban households do not have access to any form of latrine facility and defecate in the open.
- Census 2011 also revealed that about 37 per cent of urban households are connected with open drainage and another 18 per cent are not connected at all. Less than 20 per cent of the road network is covered by storm water drains.

Urban water supply

Target for the Twelfth Plan period:

- Universalisation of water and sanitation to urban areas
- Reduction in unaccounted for water
- Hundred per cent metering of water supply
- Ensure 24 × 7 water supply
- Steadily bring down distribution inefficiencies by bring down wastage of water closer to international best practice
- Commit to quality of water to be supplied
- Ensure that the cities are free from open defecation and measures for providing toilets
- Community toilets especially in areas that are home to the economically weaker section
- Provide sufficient no of public toilets/urinals in city

COMMENTS

Around 20% of the household in rural India do not have any facility such as electricity, drinking water and sanitation. It is as high as 50.9% in Odisha and 50.8% in Jharkhand. On other side just 18% of rural India has all three facilities (TOI 2013, 28th Sept). in spite of many missions and campaigns the development is poor.

Water Security Pilot project:

As a follow up to the International Workshop on Achieving Drinkind water security in water stressed and quality affected areas, held in May 2010, pilot projects are being launched with the objective of achieving drinking water security in a holistic manner, through a four-pronged approach of

i. Measures for source sustainability through convergence with MNREGS, IWMP and other Watershed programmes and NRDWP
ii. Participatory integrated water resources management led by Gram Panchayats
iii. Preparation of drinking water security plans by villages
iv. Making the selected villages open defecation free and ensuring proper solid and liquid waste management (MDWS).

WHO Water Quality and Health Strategy 2013-20

- Contaminated water serves as a mechanism to transmit communicable diseases such as diarrhoea,cholera, dysentery, typhoid and guinea worm infection. WHO estimates that in 2008 diarrhoeal diseaseclaimed the lives of 2.5 million people. For children under five, this burden is greater than the combinedburden of HIV/AIDS and malaria.
- A total of 58 countries from all continents reported a cumulative total of 589,854 cholera cases in 2011,representing an increase of 85% from 20104. The greatest proportion of cases was reported from the islandof Hispaniola and the African continent. These trends reflect the need to shift from basic responsiveness to a comprehensive, multidisciplinary approach that works with communities to improve access to safedrinking-water and sanitation, encourages behavioural change and promotes the targeted use of oralcholera vaccines where the disease is endemic.

- Millions of people are exposed to dangerous levels of biological contaminants and chemical pollutants intheir drinking-water due to inadequate management of urban, industrial or agricultural wastewater. Inaddition, dangerously high concentrations of chemical hazards, such as arsenic and fluoride, originatingfrom natural sources affect millions and cause conditions such as cancer and fluorosis. Inorganic arsenic is present at high levels in the groundwater of a number of countries, including Argentina, Chile, China, India(West Bengal), Mexico, the United States of America, and particularly Bangladesh where 20 million and 45million people are at risk of being exposed to arsenic concentrations that are greater than the nationalstandard of 50 µg/L and the WHO guideline value of 10 µg/L, respectively.
- In many parts of the world, insects that live or breed in water serve as vectors of disease. Water quality is not a major determinant, although anopheline vectors of malaria breed only in clean water and culicinevectors of lymphatic filariasis prefer organically polluted water. However, an immediate link exists betweenhousehold water storage and vector breeding. Dengue fever outbreaks have increased fourfold since 1995,with 2.5 billion people at risk today. WHO estimates that 50-100 million dengue infections occur worldwideeach year.

URBAN SANITATION PROGRAM

Under Urban Sanitation Program the following activities were considered: 1) Providing reasonable level of sanitation facility to a large population, 2) Total elimination of dry latrines and manual scavenging, 3) Low cost on-site sanitation in unsewered parts of cities, small and medium towns, 4) Technological innovations to improve the reusability of the recycled waste, 5) "Polluter paying" principle should be applied to finance waste disposal Programs 6) Involvement of NGOs, private sector and community.

NATIONAL SLUM DEVELOPMENT PROGRAM

The National Slum Development Program was launched by the Prime Minister in 1996 in UP. Under this, additional central assistance is being released for the development of slums with following objectives:

- To development the slum for better health

Strategy

- Upgradation of urban slums by providing physical amenities like water supply, storm water drains, community bath, widening and pavement of existing lanes, sewers, drains, community latrines, street light, etc.
- Provision of community infrastructure and social amenities such as preschool education, non-formal education, adult education, immunization, maternity and child health and primary health care.

Ministry of Urban Employment and Poverty Alleviation is nominated as the nodal ministry to monitor the program of the program in the states. Through this program 3.72 crore of slum dwellers were benefited.

World Water Day

World Water Day is observed on March 22nd each year focusing attention on the need-a) address the problems relating to drinking water supply; b) increase public awareness on the importance of conservation, preservation, and protection of water resources and drinking water supply; c) increasing multisectoral and agencies partnership.

2008 was the International Year of Sanitation and November 19 is World Toilet Day.

SWACHH BHARAT MISSION

To accelerate the efforts to achieve universal sanitation coverage and to put focus on sanitation, the Prime Minister of India launched the Swachh Bharat Mission on 2nd October, 2014. The Mission Coordinator shall be Secretary, Ministry of Drinking Water and Sanitation (MDWS) with two Sub-Missions, the Swachh Bharat Mission (Gramin) and the Swachh Bharat Mission (Urban), which aims to achieve Swachh Bharat by 2019, as a fitting tribute to the 150th Birth Anniversary of Mahatma Gandhi, which in rural areas shall mean improving the levels of cleanliness in rural areas (MDWS).

Present government has started swachh bharat mission with following objectives:

a) Bring about an improvement in the general quality of life in the rural areas, by promoting cleanliness, hygiene and eliminating open defecation.

b) Accelerate sanitation coverage in rural areas to achieve the vision of Swachh Bharat by 2nd October 2019.
c) Motivate Communities and Panchayati Raj Institutions to adopt sustainable sanitation practices and facilities through awareness creation and health education.
d) Encourage cost effective and appropriate technologies for ecologically safe and sustainable sanitation.
e) Develop wherever required, Community managed sanitation systems focusing on scientific Solid & Liquid Waste Management systems for overall cleanliness in the rural areas.

Strategy

1. Providing flexibility to State Governments, as Sanitation is a state subject, to decide on their implementation policy and mechanisms, taking into account State specific requirements. The Government of India's role would be to complement the efforts of the State Governments through the focused programme being given the status of a Mission, recognizing its dire need for the country. It is suggested that Implementation Framework of each State be prepared with a road map of activities covering the 3 important phases necessary for the Programme:
   (i) Planning Phase
   (ii) Implementation Phase
   (iii) Sustainability Phase

A schematic representation of the SBM Programme Implementation Diagram is represented below as an illustrative model. In the context of the various interventions identified in the Implementation Framework, certain approaches can be considered. The suggested approach would be to adopt the Community led and Community Saturation approaches focusing heavily on collective behavioral change. Emphasis is to be placed on awareness generation, triggering behaviour change and demand generation for sanitary facilities in Houses, Schools, Anganwadis, places of Community congregation, and for Solid and Liquid Waste Management activities.

Comments

In many countries, the progress being made towards universal access to improved drinking water and sanitation is falling well short of the maximum achievable level. Progress does not appear to be correlated with a country's social and economic characteristics. The between-country variations observed in such progress may be linked to variations in government policies and in the institutional commitment and capacity needed to execute such policies effective

References

Annual report 2014-15.

Arnold BF, Colford JM, Jr. (2007) Treating water with chlorine at point-of-use to improve water quality and reduce child diarrhea in developing countries: a systematic review and meta-analysis. Am J Trop Med Hyg 76: 354–364.

Bhattacharya SK. Progress in the prevention and control of diarrheal diseases since Independence. Natl Med J India. 2003;16 Suppl 2:15-9.

Black RE, Cousens S, Johnson HL, Lawn JE, Rudan I, et al. (2010) Global, regional, and national causes of child mortality in 2008: a systematic analysis. Lancet 375: 1969–1987.

Boisson S, et al. Effect of Household-Based Drinking Water Chlorination on Diarrhoea among Children under Five in Orissa, India: A Double-Blind Randomised Placebo-Controlled Trial. The PloS Med 10(8): e1001497. doi:10.1371/journal.pmed.1001497

Clasen T, Roberts I, Rabie T, Schmidt W, Cairncross S (2006) Interventions to improve water quality for preventing diarrhoea. Cochrane Database Syst Rev 3: CD004794.

de Albuquerque. Investing in sanitation is investing in human dignity 2008. http://www2.ohchr.org/english/issues/water/iexpert/index.htm

Fewtrell L et al. An estimation of the global burden of disease due to skin lesion caused by arsenic in drinking water. J water and health 2005; 3(2): 101-7.

Fewtrell L, Kaufmann RB, Kay D, Enanoria W, Haller L, et al. (2005) Water, sanitation, and hygiene interventions to reduce diarrhoea in less developed countries: a systematic review and meta-analysis. Lancet Infect Dis 5: 42–52.

Govt. of India. India 2005. Ministry of Information and Broadcasting, Publication Division 2005.

Govt. of India. National Rural Drinking Water Programme (NRDWP). Available from http://www.mdws.gov.in/NRDWP.

Govt. of India. Total sanitation campaign. http://rural.nic.in/sites/downloads/pura/Total%20Sanitation%20Campaign%20-%20DDWS.pdf

Govt. of India. Nirmal gram puraskar-Guidelines-2010. Available from http://hptsc.nic.in/pdf/ngp.pdf.

Govt. of India. 12th Five Year Plan. Available from http://planningcommission.nic.in/aboutus/committee/wrkgrp12/wr/wg_indus_rural.pdf

Jain CK. Arsenic contamination in ground water: Indian scenario. Indian J Environ Health. 2002 Jul;44(3):238-43.

Jain S, Sahanoon OK, Blanton E, Schmitz A, Wannemuehler KA, et al. (2010) Sodium dichloroisocyanurate tablets for routine treatment of household drinking water in periurban Ghana: a randomized controlled trial. Am J Trop Med Hyg 82: 16–22.

MDWS. Water security pilot project. MDWS, Govt. of India. [Cited 2016 June 1]. Available at: http://www.mdws.gov.in/water-security-pilot-projects

Ministry of Drinking Water and Sanitation. National Rural Drinking Water programme. Ministry of drinking Water and sanitation, Govt. of India. 2013. Available at: http://mdws.gov.in/sites/default/files/NRDWP_ Guidelines_2013.pdf

MRD. Total sanitation campaign. Ministry of Rural Development. [Cited 2016 June 2]. Available at: http://rural.nic.in/sites/downloads/our-schemes-glance/NewInitiativeTSC.pdf.

MDWS. Swachh Bharat Mission- Gramin. MDWS, Govt. of India. 2014. Available at: http://www.mdws.gov.in/sites/default/files/SwachBharatGuidlines.pdf

MDWS. Annual report 2014-15. Ministry of Drinking water and Sanitation, Govt. of India. [Cited 2016 June 1]. Available at: http://www.mdws.gov.in/sites/default/files/Annual-Report-%20Drinking%20Water_0.pdf

NEERI (2004) Potable water quality assessment in some major cities in India. JIPHE, India. 65 p.

Properzi F (2010) Rapid assessment of drinking water quality. Stockholm World Water Conference. Stockholm, Sweden.

Schmidt WP, Cairncross S (2009) Household water treatment in poor populations: is there enough evidence for scaling up now? Environ Sci Technol 43: 986–992.

SDG. Available at: http://www.un.org/sustainabledevelopment/water-and-sanitation/

Verma A, Bansal RK. Universal Right to safe water. Ind J Com Med 2007; 32 (1): 17.

Wilkinson RG. Unhealthy societies: the affliction of inequality. London: Rontledge 1996.

World Health Organization-UNICEF-WSSCC (2000): Global Water Supply and Sanitation Assessment Report.

WHO. Diarrhoeal diseases. Geneva. WHO. [Cited 2016, June 1]. Available at: http://www.who.int/mediacentre/factsheets/fs330/en/

WHO. Health and economic cost of poor sanitation. Geneva. WHO. [Cited 2016, June 1]. Available at: http://www.searo.who.int/mediacentre/features/2014/the-health-and-economic-cost-of-poor-sanitation/en/

WHO. Use of improved drinking water sources. Global Health Observatory data. Geneva. WHO. [Cited 2016 June 1]. Avaialble at: http://www.who.int/gho/mdg/environmental_sustainability/water_text/en/

Wright J, Gundry S, Conroy R (2004) Household drinking water in developing countries: a systematic review of microbiological contamination between source and point-of-use. Trop Med Int Health 9: 106–117.

CHAPTER 40

NATIONAL BIOMASS COOKSTOVES PROGRAM

Household air pollution (HAP), which results from incomplete combustion of the solid fuels traditionally used for cooking and heating, affects the homes of nearly 3 billion people (Lim 2012). It is the leading environmental cause of death and disability worldwide, with highest risks for women and children due to their domestic roles. The high levels of pollutants found in HAP cause a range of diseases, in addition to burns and scalds and injuries or violence experienced during fuel collection. Additionally, household solid fuel use can pose substantive environmental risks, including degradation from fuel gathering as well as climate change from release of both CO and short-lived climate forcers, such as black carbon, during combustion.

Using data from 2004, the World Health Organization (WHO) estimated that nearly 2 million premature HAP related deaths occurred from acute lower respiratory infections (ALRI) in young children, chronic obstructive pulmonary disease (COPD), and lung cancer (WHO 2009). The recent Global Burden of Disease 2010 update by the Institute for Health Metrics and Evaluation nearly doubles the estimated mortality to 3.5 million (4 million including HAP's contribution to 16% of outdoor air pollution deaths), due to the inclusion of HAP deaths from cardiovascular disease and lung cancer from biomass smoke (Lim et al 2012). Prenatal exposure to HAP is linked to the increased risk of stillbirth, low birth weight (Pope 2010), and impaired cognitive development (Dix - Cooper et al 2012), and direct HAP exposure is linked to cataracts (Pokhrel et al 2005) and possibly trachoma (Mesfin 2006, Martin et al 2013).

Health problems in workers are also associated with fuel wood collection or involved in industries using biomass: frequent falls, bone fractures, eye problems, headaches, rheumatism, anemia, chest, back and internal disorders and miscarriages from carrying loads often heavy load.

Even though nearly three-fourths of the country's population lives in rural India, they use less than one-fourth of the total commercial energy like electricity, petroleum, kerosene, diesel and coal. As in most developing countries the rural energy scenario in India too is dominated by the domestic sector which accounts for 90% of the total energy consumed, firewood, cow dung and agricultural wastes. The unrestrained growth in the use of non-commercial sources, for meeting rural energy needs, available of zero private cost has resulted in serious environmental problems. Rural people, unfortunately, have no choice but to depend upon such sources to meet their needs and remain trapped in a subsistence economy.

In most parts of rural India, women spend between 2-5 hours daily just collecting branches, twigs, dried leaves as biofuels to stoke the kitchen fires. As forests deplete and move further and further away, these women have to walk longer distances carrying heavier loads sometimes as impossible 35 kg per headload. On such long treks, the women are often accompanied by their daughters who drop out of school because they are either needed on these treks or must stay at home to look after younger siblings. The girl-child, trapped in these circumstances, thus becomes confined to the unpaid reproductive and subsistence sector of

the economy, playing an essential but unrecognized role. Energy crisis of this kind leads to a chain of interrelated development impacts-those that are beyond the apparent economy, efficiency, technology, and fuel substitution issues. In this context, promotion of fuel efficient smokeless cooking devices with a view to conserve fuel wood, to improve health and hygienic conditions, reduce drudgery for women and children, and to improve the overall quality of life, assume considerable significance.

The Ministry of New and Renewable Energy during 2009-10 launched **National Biomass Cookstoves Initiatives (NBCI)** to ascertain the status of various types of biomass improved cookstoves being developed and promoted by various organizations, NGOs, entrepreneurs and industries in the country, and to identify ways and means for the development and expansion of the deployment of improved biomass cookstoves. Use of biomass for cooking purpose has direct relationship on health and welfare of the weakest and most vulnerable sections of society. The cleaner combustion in these devices will also greatly reduce greenhouse pollutants.

The NBCI of MNRE was structured differently from the earlier National Programme on Improved Chulhas (NPIC), although building on the several successes of that programme as also drawing lessons from the experience gained from its implementation. Under this initiative, a series of pilot scale projects were envisaged using several existing commercially – available and better cookstoves and different grades of process biomass fuel.

Biomass cookstove is basically a combustion device which burns biomass fuel more efficiently with reduced emissions and offers cleaner cooking energy solutions. Biomass Cookstoves are of two types; fixed type and portable type. The portable cookstoves are also of two types; natural draft and forced draft. Advanced cookstoves utilizing fans are more efficient cookstoves compared to natural draft ones. Each type of cookstove can be used for domestic as well as community cooking applications. The improved cook-stoves may be made with metal, ceramic and terracotta/ pottery (durable type) and combination thereof. With this, the stoves will be categorized as metallic (MS, SS, cast iron and combination thereof), metal clad ceramic/ pottery and ceramic types.

As per the final report of IIT Delhi, the field performance evaluation of 400 nos. of community size cook-stoves for cooking in Mid-day Meal schemes in government schools in the States of Andhra Pradesh, Chhattisgarh, Uttar Pradesh, Maharashtra, Madhya Pradesh & Haryana indicated reduction in fuel consumption in the range 40-60%, emission reduction in the rage 60-70% and saving cooking time in the range 10-30% compared to traditional chulha. In another pilot scale project for demonstration of 12000 nos. of biomass cook-stoves for domestic cooking applications 3000 nos. of cookstoves have been distributed in two districts of Khistwar & Doda in J&K while in other States like Karnataka, Bihar , U.P& Jharkhand the distribution of the stoves is in progress. The Ministry initiated a new proposal for promoting the development and deployment of Unnat Chulhas (Biomass Cookstoves) in the country during the 12th Plan Period.

Objectives

i. To develop and deploy improved biomass cook-stoves for providing cleaner cooking Energy solutions in rural, semi-urban and urban areas using biomass as fuel for cooking.
ii. To mitigate drudgery of women and children using traditional chulha for cooking.
iii. To mitigate climate change by reducing the black carbon and other emissions resulting from burning biomass for cooking.

Activities

i. To support R&D activities on development of efficient and cost effective designs of biomass cook-stoves with reduced emissions.
ii. To provide support for Test Centres for carrying out performance testing of biomass cook-stoves as per BIS.
iii. iii.Development of revised test protocols and standards.
iv. To take up a series of pilot scale projects using existing commercially available and better chulhas and different grades of process biomass fuel with ultimate aim exploring a range of technologies deployment biomass processing

and delivery models leveraging public-private partnerships.

iv. To support awareness and marketing campaigns and creating enabling environment

v. for mass production of processed biomass fuel, network of dealers, entrepreneurs training and supply chain mechanism.

vi. Supporting training to manpower facilitating operation and maintenance networks at local level thus generating opportunities for employment.

vii. Taking up dissemination programme on family type and large size Unnat Chulhas / cook-stoves for cooking applications.

viii. Awareness for use of biomass cookstove in target groups.

ix. The field and market experience of the above pilot project will be analysed for developing a business model for commercialization including availing CDM benefit for biomass cookstove. The possibility of establishing a Section 25 company will be explored for carrying out the business of promotion of Unnat Chulhas in the country in future.

Kitchens of Mid-day Meal (MDM) scheme, Anganwadis, Forest Rest Houses, Tribal Hostels and small business establishments (road side dhabas, small hotels and restaurants and a variety of cottage industries like textile dyeing, drying of spices etc.) to be supplied with improved biomass cookstoves complying with improved standards.

Reference

http://mnre.gov.in/schemes/decentralized-systems/national-biomass-cookstoves-initiative/

CHAPTER 41

EVALUATION OF A NATIONAL HEALTH PROGRAM

Definitions

Evaluation is defined as the collection and analysis of information to determine program performance, i.e., "finding out the value of something". Evaluation of health services means a systematic and scientific process of determining the extent to which an action or sets of objectives are achieved. It involves measurement of adequacy, effectiveness and efficiency of health services. Concept of the term used for describing and judging some selected attributes of an individual or group of individual, a curriculum procedure, a total program or any other aspects of education. The process of evaluation involves three distinct stages-selecting the attributes for evaluation, synthesizing of evidences resulting from these procedures into a final judgment. It should be differentiated from Monitoring.

Monitoring is a continuous or intermittent evaluation conducted to maintain quality or stability of output; It is a formative evaluation. Monitoring is the day-to-day follow-up of activities during their implementation to ensure that they are proceeding as planned and are on scheduled. Monitoring consists of keeping track of the course of activities and identifying deviations so that activities can be put back on their right tract (Kishore 2007).

A *Program* is defined as "an organized response to eradicate or eliminate or reduce one or more problems where the response includes one or more objectives, and the expenditure of resources" (Kane et al. 1974). Program is a (formal) set of procedures to conduct an activity, e.g., control of malaria. It is an ordered list of instructions directing a computer to carry out a desired sequence of operations. The objective is normally the solution of a problem. The sum total of efforts aimed at changing social norms and health behaviors and providing health services, including research, public education, and advocacy, behavior change interventions, social marketing, clinical services and community based distributions (Kishore 2013).

It should be remembered that every activity needs to be evaluated. However, not every activity can be easily evaluated. When one is assessing the achievement then it should be based on scientific knowledge. There should not be any false sense of security in achieving high percentage of coverage and labeled it wrongly, e.g. defining Eradication for Elimination or Control. For every evaluation there is a need of statistics which is usually called as *Health Statistics*. It is an aggregated data describing and enumerating attributes, events, behavior, services, resources, outcomes, or costs related to health, disease, and health services. The data may be derived from survey instruments, medical records, and administrative documents.

Project Appraisal is analysis undertaken prior to project implementation to estimate net benefit in relation to costs.

Purpose of evaluation

The fundamental purpose of evaluation is to improve health plans, health programs, health infrastructure, and

health services delivery by producing information relevant to management decision- making, and to assist planners and managers in making improved decision about program and projects. The results of National Programs can be utilized by the government to impress the people. The purpose of evaluation could also be to assess the need for funding or further coordination of fund.

Responsibility for evaluation

In principle, the responsibility for evaluation will lie on individuals and groups responsible for the development and application of the managerial process at various policy and operation levels, e.g. local, district and central. Evaluation could be performed by:

1. The planners themselves;
2. Ad hoc research groups;
3. Those responsible for health development;
4. Those responsible for implementation; and
5. The community itself, especially wherever primary health Programs are being carried out.

Periodicity

Although evaluation should be a continuous process, its results have to be summarized and reported at given times or specified intervals. For example, it will be possible to summarize assessment of progress and efficiency once a year; effectiveness in a longer time than one year; and impact may be assessed in longer time that could five years from the inception of the program.

Type of Evaluation

Based on the purpose, progress and components and activities, evaluation can be divided into:

1. Total (overall)
   a) plan,
   b) program,
   c) project
2. Partial
   a) part of the year
   b) part of the program
   c) part of the project
   d) some of the activities
3. Time related
   a) longitudinal
   b) cross-sectional
   c) initial (at the start of program)
   d) mid-term (at the middle of program), final or terminal (at the end of program), adhoc, periodic (any point of time)
4. In relation to Planning process
   a) Baseline or bench mark evaluation (for setting up baseline for next planning cycle)
   b) appraisal (for selection of projects amongst various alternative projects)
   c) concurrent evaluation (for judging the progress of activities when program is in operation);
5. According to agency
   a) internal (by the implementing evaluation)
   b) external evaluation
6. It has been suggested that there should be five dimensions of program performance that need to be evaluated:

A. Relevance evaluation: refers to activities designed to determine whether the program is needed or whether the program is targeting its efforts at the individuals in need. It is also known as "need assessment". Relevance of the program can be asked by following questions:

i) What problems does the program address?
ii) How adequate is the definition of the problem?
iii) What is the level of need for services associated with the problem?
iv) How accurate is the information about the problem?
v) How adequate is the definition of the Program?
vi) Is the program appropriate to the defined problem?
vii) Are those identified to be in need of services receiving the program?

B. Progress evaluation: refers to efforts made to assess how well program implementation complies with the program plan. It is also known as "implementation evaluation". The following questions may be asked to find out progress evaluation:

i) Are the required personnel, equipment, and financial resources in place at the times and locations necessary to meet program needs? *Inputs* are goods and services used in production, such as capital goods (building, equipment, labor, raw materials etc.). Input is any resource used in an activity or step of a method. Policy documents, discussions with health service staff, products of previous activities, activity schedules, and manpower

are all examples of inputs. *Job Analysis* of human resource is essential. It is a process of examining the various components of a job and the circumstances in which it is performed. A study of an occupation based on the analysis of the major and minor duties individual there and the knowledge, habits and skills required for success in it.

Capital is Money and goods, e.g. buildings, plants, machine, used in running a business. Capital-the average annual cost of capital recovery with interest. The stock of goods, which are man-made and used in production (as opposed to consumption). Fixed capital (durable) goods such as buildings and machinery) is usually distinguished from circulating capital (stocks of raw materials and semi-finished goods which are rapidly used up) in accounting conventions, capital goods are usually taken as those with a life of more than year, such as land, buildings and equipment (Kishore 2013). Capital is a resource in program input.

ii) Do program activities clearly conform to the original plan?

Task Analysis is a systematic process of defining a job, determining what performance discrepancies exist in that job, and providing a basis for selecting important instructional objective to teach so that the employees can do that job.

iii) Are there any unanticipated factors influencing program implementation?

iv) Are the various activities or components of the program being provided to all program targets with uniform quality and quantity?

It is very useful to conduct this evaluation in the early phase of the program implementation because there are fair chances of taking managerial decisions that might: terminate the project, reorganize the project, fine tune the program, or proceed with the project as it has been implemented.

C. **Effective Evaluation**: refers to whether Program results meet predetermined objectives, One may ask following questions for effective evaluation:

i) Did the program meet its stated objectives?

ii) Were program providers satisfied with the effects of program activities?

iii) Were program beneficiaries satisfied with effects of program activities?

iv) Is the problem reduced or eliminated as a result of the Program?

It is the most difficult task to find out the effect, a program has made. To establish the cause and effect association (Causality) following criteria must meet:

1. A change in one variable must be accompanied by or associated with the change in another can be determined by many statistical procedures.
2. Causes must precede effects. If the effect occurred before the assumed "cause" that cause automatically would be ruled out as the real cause.
3. Elimination of all competing causal explanation: confounding variables should be excluded or adjust before establishing causal link.
4. The program if replicated must produce similar results.
5. There must be plausible explanation for the causal relationship that is compatible with the available data.

The program results mainly its internal validity (did the program cause outcome) and external validity (how generalizable are the results of this program demonstration?) that may be affected (Campbell & Stanley 1963) by many factors:

Internal Validity

a) Extraneous events occurring during the period in which the program is implemented may affect the outcomes measures.

b) Physical and psychological processes associated with growing older may affect Program outcomes, especially with long-term programs.

c) Reactive effect of pretest is present when individuals may do better on a second test.

d) Change in instruments/ scales/ observers who collect the data may themselves produce changes in the obtained measurements.

e) Various biases in selection of individuals or groups may affect the results.

f) Attrition/ loss of participants due to deaths or migration may also affect the results.

External Validity

a) Interaction of intervention with pretesting: Pre-testing might sensitize participants to the intervention of the program, making the participants unrepresentative of the non-pre-tested population.
b) If the population is not selected randomly then selected population may be different from the whole population.
c) Reactive effects of testing: Individuals who know they are being tested, observed, or otherwise assessed may react to such situations differently than the non-tested population.

D. Impact Evaluation: refers to the long-term outcomes of the program. The impact of a program is its overall effect on health status and socioeconomic development. Effectiveness mainly focuses of immediate program outcomes whereas impact evaluation is looked at on the long-term effects. Sometime there is a remarkable different in results obtained in effective evaluation, e.g. just after mass education campaign the knowledge about risk of tobacco smoking may be very high however, there may not be any reduction in the number of smokers.

E. Efficiency Evaluation: refers to the analysis of results obtained in relation to the resources spent to maintain the Program, i.e., "a measure of output per unit of input". One has to perform cost-benefit or cost-effectiveness analysis to answer the following questions:

a) Do program benefits exceed the costs incurred?
b) Are program benefits more or less costly per unit of outcomes when compared with other programs designed to achieve the same objectives?

For this purpose, it is necessary to define: 1) **service unit** (visit, vaccination, hospital day, operation, dressing, etc.), 2) **time** (duration in days, hours, minutes, etc.), and 3) **cost** of the service unit.

The efficiency evaluation is of two types:

A. *Technical efficiency:* In this various issues are analyzed for example operational level, methods, manpower, finance, facilities, collaboration and managerial control.

B. *Cost efficiency:* It is the ratio of total cost of the Program or a component to the number of units of services delivered by the program or its component, irrespective of the outcome of those services. For example the cost of vaccine, staff time, transportation, publicity and facilities etc is Rs.1000/- and a total of 100 children got vaccination, then cost/efficiency ratio of the Program is 10:1 or Rs. 10/- per vaccination.

We must understand what is cost and various types of costs involved in program.

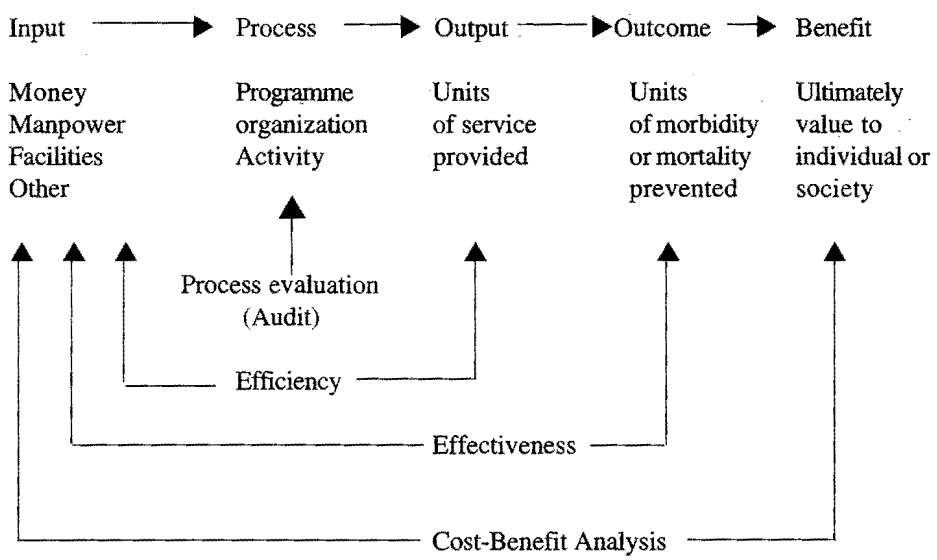
Cost refers to a factor of production, whether it is a primary factors of production or a produced means of production. It is a monetary valuation applied to an asset or service that has been obtained by an expenditure of cash by a commitment. The *average cost* of production is equal to the total cost of production divided by the quantity of the commodity produced.

Cost-Direct is the costs of inputs directly involved in the production of goods or services e.g., the direct costs of the disease are the expenditure for health services directly attributable to the treatment of disease, such as cost for doctors fee, drugs, etc. *Unit Cost* is a unit of product, service, or time in relation to which cost may be expressed. The total cost of an activity divided by the number of units of output produced. *Indirect Cost* is the productivity losses associated with illness, or the work time taken up medical treatment. Typically, these are valued by using earnings as a proxy. Those which are not directly attributed to the production or services, but indirectly involved in the production or services. For example, indirect costs of disease are the economic losses attributable to the disease which can be measured in monetary terms namely, future earnings lost due to premature deaths and productivity lost as a result of morbidity (Kishore 2013).

Fixed Cost is the cost, which do not vary with the level of output in the time period considered (usually one year). Cost which tends to be constant at all levels of production. They do not tend to increase or decrease with the changes in volume or production, such as costs of building, staff, etc.

Incremental Cost: the additional cost of one program,

Figure 39.1: Health Programe – System evaluation model



alternative or option over and above another. Added costs which are incurred when a change in the level / pattern method of production is made in a particular project in hand or certain additional products are manufactured.

Marginal Cost is the amount at any given volume of output by which aggregate costs are changed if the volume of output is increased or decreased by one unit. It is the aggregate of variable costs plus variable overhead.

Cost Operating is a recurrent costs i.e., the cost of operating an enterprise or service; those costs of providing a service that vary with the level of output (e.g. drugs) in contrast to those which are fixed over a given time period, usually a year (e.g., capital costs), usually calculated on an annual basis.

Opportunity Cost in health economics, the value that resources, used in a particular way would have if used in the best possible or another specified alternative way. The benefits to be derived from using resources in their best alternative use. It is therefore a measure of the sacrifice made by using resources in a given program. When economists use the term 'cost' they mean opportunity costs. This may not be the same as health care expenditures. *Production Cost* is the cost of the sequence of operations which begins with supplying material, labor and services and ends with primary packing of the product. *Recurrent Cost* is the costs that recur, i.e., the cost of running an enterprise, such as salary and raw material costs. It is also known as operating cost (Kishore 2013).

Cost-utility Analysis: a form of economic evaluation where the costs are expressed in money terms and where some of the consequences are expressed in utility units (e.g. quality adjusted life years or healthy day of life).

Cost-benefit Analysis: A form of economic evaluation where all the costs and benefits are expressed in money terms. In principle, this is a form of analysis which enables one to assess whether a particular objective is worth achieving. However, estimation of cost of certain services and outcomes is difficulty to measures, e.g., how much is saved in recovery from TB disease after treatment (Kishore 2007).

Input-Out Analysis: is a systematic method of describing in detail the interdependence of the production sectors of the economy. It is a statement of the output of goods and services which are needed as inputs to achieve the given volume of production of the sector. The analysis of a complex system (organization, industry, economy) to determine the quantities of input (man, machinery, capital) required to attain certain outputs (goods and services) (Kishore 2013).

Tools of Evaluation

There are many tools for Evaluation (Rundall 1992)

1. Review of records from National Health Information systems,
2. Monitoring: Input/efforts analysis, Management by Objectives, Gantt Charts, Program Evaluation and Review Technique (PERT), and the Critical Path Methods (CPM) of analysis,
3. Case Studies,
4. Qualitative studies,
5. Sample surveys: Cross-Sectional studies,
6. Cohort studies,
7. Panel studies.
8. Controlled experiments and intervention studies,

Audit is an examination or review that establishes the extent to which a condition, process, or performance conforms to predetermined standards or criteria. Assessment or review of any aspect of health care to determine its quality; audits may be carried out on the provision of care, compliance, community response, completeness of records, etc.

The general process of evaluation is almost identical to the process of research and consists of a series of closely interrelated and interdependent steps that includes: a) Determining what is to be evaluated, b) establishment of indicators, c) process of conducting study in which information is gathered, d) analysis of results, e) compilation of report. Lastly, the report should consist of recommendations on which actions can be taken. Evaluation should also suggest when the reevaluation should be carried out. Flow chart of Health Program evaluation model is given in figure 39.1. When cost of carrying out rigorous evaluation is higher, than the cost of program then the evaluation should not be carried out.

References

Benavides FG, Benach J, Diez-Roux AV, Roman C. How do types of employment related to health indicators? Finding from the second European Survey on working conditions. J Epidemiol Community Health 2000; 54: 494-501.

Campbell DT, Stanley JC. Experimental and Quasi-Experimental Designs for Research. Chicago: Rand McNally 1963.

Kane RL, Hanson R, Deniston OL. Program evaluation: Is it worth it? In Kane RL (ed): the Challenges of Community Medicine. New York: Springer, 1974.

Kishore J. A Dictionary of Public Health. New Delhi Century Publications 2013.

Micovic P. Evaluation of health Program. In WHO (ed). Evaluation training Module No. 9. WHO-SEARO, New Delhi, 1983.

Rundall TG. Health Planning and evaluation. In Last JM & Wallace RB (Ed). Maxcy Rosenau –Last Public Health & Preventive Medicine (13rd). Connecticut: Prentice-Hall Inc, 1992.

WHO. Ottawa Charter for Health Promotion. Can J Public Health 1986; 77: 425-430.

Part -II

National Policies Related to Health

CHAPTER 42

NATIONAL POLICIES RELATED TO HEALTH

Definition

Policy is a system which provides the logical framework and rationality of decision making for the achievement of intended objectives. Policy is a guide to action to change what would otherwise occur, a decision about amounts and allocations of resources: the overall amount is a statement of commitment to certain areas of concern; the distribution of the amount shows the priorities of decision makers. In short, policy set priorities and guides resources allocations. For the development of any nation the framing of policy is very vital. The national policy is also termed as public policy that is the policy at any level of government that may be formal or legal precedence over others. Policy may be set by heads of government, legislatures, and regulatory agencies empowered by other constituted authorities.

Health & Development policies

Health and development have two-way relationship. Investments in health have the potential and often lead to higher level of economic growth. On the other hand a higher level of economic growth often has the potential of higher investment in health leading directly to better health status of population and indirectly through the route of education and improvement in general awareness leading to better utilization of health services and decrease in disease load such as tuberculosis, leprosy and water borne diseases etc. in communities as a results of economic growth and development after industrial revolution in European countries much before preventive and therapeutic interventions particularly vaccines and antibiotics become available around 30s and 40s of last century.

Economic growth has clearly contributed to improvements in quality of life and health status of the population shown in the form of indicators such as infant mortality rate, maternal mortality rate, life expectancy, etc. in many countries but this does not always coincide with improvements in human well-being. Macroeconomic changes may have adverse consequences for poverty alleviation, health, and education. This highlight the needs of intersectoral action and to address to the health aspects in all development policies. All economic and development policies should benefits the welfare of people.

Agriculture policies: these are related to cropping systems, extension of land use into forest ecosystems, livestock development and mechanization. On the positive side, successful irrigation system will raise income, improve food security and with proper planning access to safe domestic water thus increasing the potential for better nutrition and health. On the negative side, these are also associated with higher prevalence of health hazards such as direct poisoning, pesticide buildup in the food chain, protein loss due to depletion of fish resources for farmers and rural workers. The direct and indirect costs of pesticide use, including

environmental damage, crop losses resulting from pest resistance or secondary pests, and poisoning etc. are largely borne by poor. Pesticides subsidies have often resulted in an unnecessary reliance on pesticides when other methods of pest management could be safer and cheaper.

Policies affecting land tenure leading to legal access to, or control over, land is often an important determinant of household income which in return means better health through greater access to health care, improved nutrition and better sanitation and hygienic living conditions. Land distribution policies promoting habitation in the new and forested areas, may increase the risk of vector borne diseases such as malaria. However, affect household income and consequently the health status especially of poor. Resettlement of population is also associated with health problems.

Industrial policies: industrial growth and associated environmental degradation and health hazards have increased the health risks to the community. Developing countries in many situations in order to increase export revenues provide investments in certain industries such as those dealing with heavy metals, and chemicals, which present serious health and environmental health hazards. Most of such industries are owned or operated by domestic firms utilizing production process, which may be primitive, use banned materials and not using pollution reduction techniques and safety measures.

Industrial growth attracts new migrants and low wage labor force, which reside in close proximity of dangerous plants. Such labor suffer maximum damage in case of accidents such as Bhopal gas tragedy. Squatter settlements are likely to proliferate around industrial plants with the potential of significant health hazards. With the expansion of industrial operations in developing countries, people suffer from parasitic diseases, respiratory infections and malnutrition as well as illnesses and disabilities associated with industrial processes such as irritation due to inhalation of gases and vapors, heavy metal poisoning, silicosis, dermatitis and cancer, hearing loss and other disabilities due to accidents. Industrial wastes are often released into lakes and streams. Heavy discharge of effluents from agriculture plants are likely to cause big hazards if released at a time when water levels are low. Health benefits of industrial policies therefore, need to assessed before implementation.

Enegry Policies: Wide range of health problems are associated with increased demand, supply and use of energy in developing countries such as indoor pollution due to fuel combustion. Health risk are associated with nuclear as well as with industrial power station. Government interventions to modify fuel and stove use by families would be a necessary step to reduce indoor pollution.

Similarly policies on urban housing, water resource, environment and forest, and other development have a significant role in health of community and health issues should be considered while designing them.

Health policy aims at the improvement of the conditions under which people live: secure, safe, adequate, and sustainable livelihoods, lifestyles and environments, including housing, education, nutrition, child care, reproductive health, transportation, information and communication, necessary community and personal social and health services. As we know that health of the people get affected by various factors that are the domain of other sectors of the government. So, we have various national policies that are emphasizing many measures to promote and protect the health of the people (Table 40.1).

The best policy is the one which is framed on basis of scientific analysis of the status of community health. The government should prioritize the health action. Based on severity and magnitude of a disease and its vulnerability to the control measures the priority for action is determined.

There are many indicators which can measures the burden of disease in a community. For example, mortality indicators-death rates, death due to TB, Disability Adjusted Life Year (DALY) Loss etc.; morbidity indicators-incidence and prevalence rates, admission rates, etc.; and nutritional indicators-low birth weight, weight to height, etc., are widely used to assess the health status of the people. Recent analysis indicate the communicable diseases would be less important in coming future so upcoming policies should emphasize more on noncommunicable diseases.

Table 40.1: National Policies Related to Health

1.	National Health Policy 2002
2.	National Population Policy 2000
3.	National AIDS Prevention and Control Policy 2002
4.	National Blood Policy 2002
5.	National Policy For the Empowerment of Women (2001)
6.	National Policy & Charter for Children 2003
7.	National Youth Policy 2003
8.	National Policy for Old Person 1999
9.	National Policy for Person with Disabilities
10.	National Nutrition Policy 1993
11.	National Health Research Policy Draft
12.	National Policy on Education
13.	National Pharmaceutical Policy
14.	National Policy on Indian System of Medicine & Homeopathy 2002
15.	National Water Policy
16.	National Environment Policy 2006
17.	National Housing and Habitat Policy 1998
18.	National Conservation Strategy & Policy Statement on Environment & Development 1992
19.	National Policy on Resettlement and Rehabilitation for Project affected families 2006

COMMENTS

- Policy is indicating intension of a government or authority to perform to achieve set objectives. For last few years there are many policies formulated, which is good for the country. Policy should not be the decorative piece of document. Every effort made to accomplish policy objective should be sincere. In spite of many policies launched by the government not much improvement can be seen as far as implementation is concerned. This is due to incoordination between various members of the policies implementation. Policy maker and implementing managers never sit together to design the program. There are other reasons of failure in policy implementation such as corruption, absenteeism, lack of leadership, lack of team spirit, lack of dedication for change in the scenario of the country, etc. However, efforts should be made by each members of health team to reaffirm his/her responsibility.
- Government should not take these policies as an obligation to fulfill the demand of international agencies rather, it should have positive attitude and participated actively in international development.
- Unfortunately, the public healthcare or health of the mass population has never been in the priority for policy makers and bureaucrats. Since Independence, there have been various commissions and committees appointing to analyse and review of health situations and make recommendations to further development. Some of these commissions and committees have submitted their excellent report and recommendations, but on the policy making and implementation level, it never accepted as recommended. Even, as other nations, India also committed/accepted to be spending 5 percent of its GDP on health sector, in 1948 (at the time of Wold Health Organisation formation in 1948). Over the years, Indian economy has been rising and India giving loans to other countries, but still now, expenditure on health did not crossed 2 percent of the Indian GDP (Kumar & Kishore 2012).

References

Gupta JP, Sood AK. Contemporary Public Health. New Delhi: Apothecaries Foundation 2005.

Kishore J. A Dictionary of Public Health. New Delhi: Century Publications 2013.

Kumar S & Kishore J. Inequity in Indian Healthcare: An analysis of women's health. Germany: Lambard Academic Publishing 2012.

Last JM & Wallace RB (Ed). Maxcy Rosenau –Last Public Health & Preventive Medicine (13rd). Connecticut: Prentice-Hall Inc, 1992.

CHAPTER 43

NATIONAL HEALTH POLICY 2002

INTRODUCTION

Policy is a system, which provides the logical framework and rationality of decision making for the achievement of intended objectives. It is the statements that guide and provide discretion within limited boundaries. Policy sets priorities and guide resources allocations. Public health policy improves conditions under which people live: secure, safe, adequate and sustainable livelihood, lifestyles and environments, including housing, education, nutrition, childcare, reproductive health, transportation, information and communication, necessary community and personal social and health services. Policy adequacy may be measured by its impact on population health (Kishore 2007).

First formal National Health Policy was formulated in 1983, and since then there have been marked changes in the determinant factors relating to the health sector. Some of the policy initiatives outlined in the NHP-1983 have yielded results (Table 43.1) while, in several other areas, the outcome has not been as expected.

While the public health initiatives over the years have contributed significantly to the improvement of these health indicators, it is to be acknowledged that public health indicators / disease-burden statistics are the outcome of several complementary initiatives under the wider umbrella of the developmental sector, covering Rural Development, Agriculture, Food Production, Sanitation, Drinking Water Supply, Education, etc. Despite the impressive public health gains, the morbidity and mortality levels in the country are still unacceptably high as compared to the developed countries. Further dedicated efforts are required to achieve goal of "Health for All in 21st century."

There is still a significant burden of communicable diseases, for example (1) malaria resurgence, insecticide-resistant malarial vectors, and other vector borne diseases like dengue, Japanese encephalitis, (2) tuberculosis, increase of drug resistant TB, (3) HIV/ AIDS emergence, for which no therapeutic cure or vaccine available, (4) The common waterborne infections – Gastroenteritis, Cholera, and some forms of Hepatitis.

Beside these diseases there is an increase in mortality through 'life-style' diseases like diabetes, cancer and cardiovascular diseases. The increase in life expectancy has increased the health care requirement for geriatric population. Similarly, the increasing burden of trauma cases is also a significant public health problem. Persistent high incidence of macro and micro nutrient deficiencies, especially among women and children is also a major concern.

In NHP-1983, a very ambitious and holistic goal was set to achieve "Health for all by the year 2000AD" through the universal provision of comprehensive

Table 43.1 Achievements of India from the Years – 1951-2000

Indicator	1951	1981	2001
Demographic Changes			
Life Expectancy	36.7	54	63
Crude Birth Rate (per 1000 population)	40.8	33.9 (SRS)	25.5 (2001)
Crude Death Rate (per 1000 population)	25	12.5 (SRS)	8.4 (2001)
IMR (per 1000 live births)	146	110	70 (2001)
Couple Protection Rate (%)	-	10.4	46.0
Total Fertility Rate	6.0	-	3.8
Epidemiological Shifts			
Malaria (cases in Million)	75	2.7	2.0 (2001)
Leprosy (per 10,000)	38.1	57.3	3.7 (2001)
Small Pox (No. of Cases)	>44887	Eradicated	—
Guinea Worm	NA	>39792	Eradicated
Polio	-	29709	265
Infrastructure			
Sub-Centers	725	57363	137311 (2001)
Dispensaries & Hospitals	9209	23555	43322 (CBHI-96)
Beds (Private & Public)	117198	569495	870161 (CBHI-96)
Doctors (Allopathy)	61800	268700	1:1800
Nursing Personnel	18054	143887	1:5600

primary health care services. Due to various reasons the NHP 1983 was unable to achieve its goal and objectives.

Scenario Before National Health Policy 2002

The public health investment in the country over the years has been comparatively low and declining, and as a percentage of GDP has declined from 1.3 percent in 1990 to 0.9 percent in 1999. Out of this, about 17 percent of the aggregate expenditure is public health spending, the balance being out-of-pocket expenditure. The States expenditure has declined from 7.0 percent to 5.5 percent. The current annual per capita public health expenditure in the country is not more than Rs. 200. The contribution of Central resources to the overall public health funding has been limited to about 15 percent.

There is a wide gap in achievements of various health indices by the urban and rural areas of various states (Table 43.2). Water supply, sanitation facilities, availability of electricity and many other services are lacking in rural India (Table 43.3) the difference is also observed in various communities (Table 43.4).

Policy and strategy of government regarding health delivery is mainly favoring vertical approach, which is very expensive and difficult to be sustained. There was shortage of professional manpower and other resources at all levels of services. Powers are not given to local self government at the districts and villages level for effective operation of health services. Health department has worked without adequate involvement of other systems of medicine however they are very well accepted in the community.

There is uneven distribution of medical, dental and nursing colleges and same is true for the quality of education. The syllabus is excessively theoretical, less flexible, making it difficult for the fresh graduate to effectively meet even the primary health care needs of the population. There is little scope for career development in super-specialty in some professions. Similarly, public health, family medicine, and health research have got low priority.

Table 43.2: Differentials in Health Status among States

Sector	BPL (%)	IMR 1999(SRS)	<5MR (NFHS-II)	% of Children underweight	MMR 1998
India	**26.1**	**70**	**94.9**	**47**	**408**
Rural	27.09	75	103.7	49.6	-
Urban	23.62	44	63.1	38.4	-
Better Performing States					
Kerala	12.72	14	18.8	27	87
Maharashtra	25.02	48	58.1	50	135
Tamil Nadu	21.12	52	63.3	37	79
Low Performing State					
Orrissa	47.15	97	104.4	54	498
Bihar	42.6	63	105.1	54	707
Rajasthan	15.28	81	114.9	51	607
UP	31.15	84	122.5	52	707
MP	37.43	90	137.6	55	498

Table 43.3: Comparative Status of urban and rural areas of the country

Parameters	Urban	Rural	Total
Piped drinking water	74.5	25.0	61.0
Sanitation facilities (Flush Latrine)	63.9	08.8	36.0
Availability of Electricity	91.3	48.1	60.0
Children Fully Vaccinated (12-23 months)	61.0	37.0	42.0
Women with any anemia (%)	45.7	53.9	52.0
Children (6-35mon) with any anemia (%)	78.8	75.3	74.0
Underweight children	38.4	49.6	47.0
Having Tuberculosis/1000 population	03.9	06.0	4.0
Proportion below Poverty line (SRS 2001)	23.6	27.1	26.0
Standards of Living Index (% Low)	14.3	44.7	-

Source : National Family Health Survey-II (1998-99)

Table 43.4: Differentials in health status among socioeconomic groups

	IMR	*< 5 Mortality*	*% Children underweight*
India	**70**	**94.9**	**47**
Scheduled Castes	83	119.3	53.5
Scheduled Tribes	84.2	126.6	55.9
Other Disadvantaged	76	103.1	47.3
Others	61.8	82.6	41.1

Major concerns are population explosion, urbanization and urban health problems, decreasing sex ratio, violence against women and her health problems, increasing prevalence of mental disorders, escalating cost of health care, inadequate health statistics, poor IEC, networking and diseases surveillance system, and 35% illiterate population.

Major challenges are increasing budget allocation, stabilizing population, involvement of private sector in secondary and tertiary health care, participation of civil society in health effective, establishing ethical code of

conduct among professionals, enforcement of quality standards for food and drugs, regulation of standards in paramedical disciplines, assessing and neutralizing the adverse impact of globalization on the health sector.

Growing interests are providing medical facilities to users from overseas, generating market for alternative system of medicine, and inter-sectoral contribution to health.

NHP-2002 has set out a new policy framework for the accelerated achievement of public health goals in the socioeconomic circumstances currently prevailing in the country.

Objectives

- To achieve an acceptable standard of good health amongst the general population of the country;
- To increase access to the decentralized public health system by establishing new infrastructure in deficient areas, and by upgrading the infrastructure in the existing institutions;
- To ensuring a more equitable access to health services across the social and geographical expanse of the country;
- To increase the aggregate public health investment through a substantially increased contribution by the Central Government;
- To strengthen the capacity of the public health administration at the State level to render effective service delivery;
- To enhance the contribution of the private sector in providing health services for the population group which can afford to pay for services;
- To rationalize use of drugs within the allopathic system; and
- To increase access to tried and tested systems of traditional medicine.

Goals to be Achieved by 2000-2015

Year	Goals to be achieved
2003	• Enactment of legislation for regulating minimum standard in Clinical Establishment /Medical Institutions
2005	• Eradicate Poliomyelitis and Yaws • Eliminate Leprosy • Establish an integrated system of surveillance, National Health Accounts and Health Statistics • Increase State Sector Health spending from 5.5% to 7% of the budget. • 1% of the total health budget for Medical Research • Decentralization of implementation of public health Programs
2007	• Achieve Zero level growth of HIV/AIDS
2010	• Eliminate Kala Azar • Reduce Mortality by 50% on account of TB, Malaria and Other Vector & Water Borne diseases • Reduce Prevalence of Blindness to 0.5% • Reduce IMR to 30/1000 live births and MMR to 100/Lakh live births • Increase utilization of public health facilities from current level of <20 to >75% • Increase health expenditure by Government from the existing 0.9 % to 2.0% of GDP • 2% of the total health budget for Medical Research • Increase share of Central grants to constitute at least 25% of total health spending • Further increase of State Sector health spending to 8%
2015	• Eliminate Lymphatic Filariasis

Policy Prescriptions

1. **Financial Resources:** It is planned, under the policy to increase health sector expenditure to 6 percent of GDP, with 2 percent of GDP being contributed as public health investment, by the year 2010. The State Governments would also need to increase the commitment to the health sector. In the first phase, by 2005, they would be expected to increase the commitment of their resources to 7 percent of the Budget; and, in the second phase, by 2010, to increase it to 8 percent of the Budget. With the stepping up of the public health investment, the Central Government's contribution would rise to 25 percent from the existing 15 percent by 2010.

2. **Equity:** NHP-2002 sets out an increased allocation of 55 percent of the total public health investment for the primary health sector; the secondary and tertiary health sectors being

targeted for 35 percent and 10 percent respectively. The Policy projects that the increased aggregate outlays for the primary health sector will be utilized for strengthening existing facilities and opening additional public health service outlets, consistent with the norms for such facilities.

3. **Delivery of National Public Health Programs:** Policy ensures the provisioning of financial resources, in addition to technical support, monitoring and evaluation of national health Programs at the national level by the Center. NHP-2002 envisages the gradual convergence of all health Programs under a single field administration. Vertical Programs for control of major diseases like TB, Malaria, HIV/AIDS, as also the RCH and Universal Immunization Programs, would need to be continued till moderate levels of prevalence are reached. The need for developing the capacity within the State Public Health administration for scientific designing of public health projects, suited to the local situation is also highlighted.

   Powers are given to the Head of the District Health administration to allocate the time of the rural health staff between the various Programs, depending on the local need. NHP-2002 recognizes that to implement such a change, not only would the public health administrators be required to change their mindset, but the rural health staff would need to be trained and reoriented.

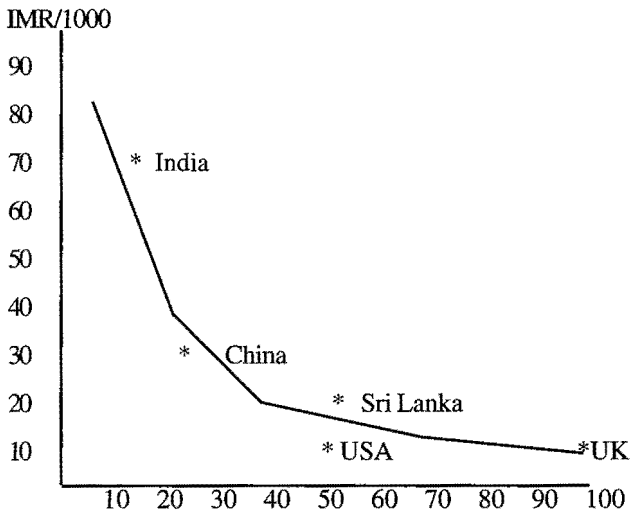
4. **The State of Public health Infrastructure:** The Policy envisages kick-starting the revival of the Primary Health System by providing some essential drugs under Central Government funding through the decentralized health system. This initiative under NHP-2002 is launched in the ***belief*** that the creation of a decentralized public health system will ensure a more effective supervision of the public health personnel through community monitoring, than has been achieved through the regular administrative line of control. Need for more frequent in-service training of public health medical personnel, at the level of medical officers and paramedics is required.

   Table 43.5 shows statistics that clearly show that standards of health are more a function of the accurate targeting of expenditure on the decentralized primary sector (as observed in China and Sri Lanka), than a function of the aggregate health expenditure (Figure 43.1). USA spends 13.7% of GDP on health but just 44.5% on public health whereas UK spends 5.8 and still has good results because the % public health expenditure is very high.

   Therefore, the Policy places great reliance on the strengthening of the primary health structure for the attaining of improved public health outcomes on an equitable basis. Further, it also recognizes the practical need for levying reasonable user-charges for certain secondary and tertiary public health care services, for those who can afford to pay.

5. **Extending Public Health Services:** Expanding the pool of medical practitioners to include a cadre of licentiates of medical practice, as also practitioners of Indian Systems of Medicine and Homeopathy has been advocated in the policy. Different categories of medical manpower like paramedical workers, practitioners of Indian System of Medicine can be permitted, after adequate training, and subject to the monitoring of their performance through professional councils.

Figure 43.1: Relationship of IMR with % expenditure on public health to the total health expenditure.



Tables 43.5: Public Health Spending and Health Indicators

Indicators	% Population with Income <$1/day	Infant Mortality	% Health Expenditure to GDP	% Public exp on health to total health exp
India	44.2	70	5.2	17.3
China	18.5	31	2.7	24.9
Sri Lanka	6.6	16	3	45.4
UK	-	6	5.8	96.9
USA	-	7	13.7	44.1

The recruitment procedures and rules for contract employment should be simplified so that trained medical manpower can be sent to under-served areas. State Governments could also rigorously enforce a mandatory two-year rural posting before the awarding of the graduate degree.

6. **Role of Local Self-Government Institutions:** NHP-2002 lays great emphasis upon the implementation of public health programs through local self-government institutions. The Policy urges all State Governments to consider decentralizing the implementation of the programs by transfer power to such Institutions by 2005.

7. **Norms for Health Care Professional:** Minimal statutory norms with constant reviewing for the deployment of doctors and nurses in medical institutions need to be introduced urgently under the provisions of the Indian Medical Council Act and Indian Nursing Council Act, respectively.

8. **Education of Health Care Professionals:** This policy envisages the setting up of a ***Medical Grants Commission*** for funding new government medical and dental colleges in different parts of the country and also will fund the upgradation of the infrastructure of the existing colleges of the country, so as to ensure an improved standard of medical education.

   A need-based and skill-oriented syllabus would make fresh doctors useful immediately after graduation. The Policy also recommends a periodic skill-updating of working health professionals through a system of continuing medical education. For undergraduate curriculum emerging concerns for geriatric disorders, forensic medicine, radiology, anesthesiology, and contemporary medical research are also highlighted.

9. **Need For Specialists in "Public Health" & "Family Medicine":** The Policy envisages the progressive implementation of mandatory norms to raise the proportion of postgraduate seats in these discipline in medical training institutions, to reach a stage wherein ¼ th of the seats are earmarked for these disciplines. It is envisaged that in the sanctioning of postgraduate seats in future, it shall be insisted upon that a certain reasonable number of seats be allocated to 'public health' and `family medicine'. Since the 'public health' discipline has an interface with many other developmental sectors, specialization in public health may be encouraged not only for medical doctors, but also for nonmedical graduates from the allied fields like public health engineering, microbiology and other natural sciences.

10. **Nursing Personnel:** The policy emphasizes the need for an improvement in the ratio of nurses vis-à-vis doctors/beds in government and private sector. NHP-2002 recognizes a need for the central government to subsidize the setting up, and the running of, training facilities for nurses on a decentralized basis. Also, the Policy recognizes the need for establishing training courses for super-specialty nurses required for tertiary care institutions.

11. **Use of Generic drugs and vaccines:** This Policy emphasizes the need for basing treatment regimens, in both the public and private domain, on a limited number of essential drugs of a generic nature. The list of essential drugs would no doubt have to be reviewed periodically. To encourage

the use of only essential drugs in the private sector, the imposition of fiscal disincentives would be resorted to. The production and sale of irrational combinations of drugs would be prohibited through the drug standards statute. NHP-2002 envisages that not less than 50% of the requirement of vaccines/sera should be sourced from public sector institutions.

12. **Urban Health:** The NHP-2002 envisages the setting up of an organized urban primary health care structure which a two-tiered system: the primary center is as the first-tier, covering a population of one lac, with a dispensary providing an OPD facility and essential drugs, to enable access to all the national health Programs; and a second-tier of the urban health organization at the level of the government general hospital, where reference is made from the primary center. It also envisages the establishment of fully-equipped 'hub-spoke' trauma care networks in large urban agglomerations to reduce accident mortality.
13. **Mental health:** NHP – 2002 envisages a network of decentralized mental health services for ameliorating categories of disorders starting from PHC where general duty doctor would be able to prescribed medicine. Upgrading of the physical infrastructure of such institutions at central government expense is also emphasized.

14. **Information, Education and Communication:** NHP-2002 envisages an IEC policy, which maximizes the dissemination of information to those population groups which cannot be effectively approached by using only the mass media. The focus would be on the interpersonal communication, folk and other traditional media involving PRIs/NGOs/Trusts. The Program will also have the component of an annual evaluation of the performance of these agencies to monitor the impact of Programs on targeted groups. The Central/State government initiative will also focus on the development of modules for information dissemination in such population groups, who do not normally benefit from the common forms of media.

    The NHP-2002 envisages that priority should be given to school health Programs which aim at preventive-health education, providing regular health checkups, and promotion of health-seeking behavior among children. The school health Programs can gainfully adopt specially designed modules in order to disseminate information relating to 'health' and 'family life'.

15. **Health Research:** This Policy envisages an increase in government-funded health research to a level of 1% of the total health spending by 2005; and thereafter, up to 2 percent by 2010 for domestic medical research focusing on new therapeutic drugs and vaccines for tropical diseases, such as TB and Malaria, as also on the sub-types of HIV/AIDS prevalent in the country. Private entrepreneurship will be encouraged in the field of medical research.

16. **Role of the Private Sector:** The Policy welcomes the participation of the private sector including private insurance in all areas of health activities – primary, secondary or tertiary. It also envisages the enactment of suitable legislation for regulating minimum infrastructure and quality standards in clinical establishments/medical institutions by 2003. The Policy envisages graduation to a scheme of quality accreditation of clinical establishments/medical institutions, for the information of the citizens. The regulatory/accreditation mechanisms will no doubt also cover public health institutions.

    A social health insurance scheme, funded by the government, and with service delivery through the private sector, would be experimented. NHP-2002 envisages the cooperation of the non-governmental practitioners in the national disease control Programs. This Policy recognizes the immense potential of information technology applications in the area of ***tele-medicine*** in the tertiary health care sector.

17. **Role of Civil Society:** The Policy envisages that the disease control Programs should earmark not less than 10% of the budget in respect of identified Program components, to be exclusively implemented through NGOs, and other civil institutions. The state would encourage the handing over of public health service outlets at any level for management by NGOs and other institutions of civil society like PRIs and trust.

18. **National Disease Surveillance Network:** This Policy envisages the full operationalization of an integrated disease control network by 2005. This public health surveillance network will also encompass information from private health care institutions and practitioners.

19. **Health Statistics:** The Policy envisages the completion of baseline estimates for the incidence of the common diseases – TB, Malaria, and Blindness – by 2005 and also recognizes the need to establish, in a longer time-frame, baseline estimates for noncommunicable diseases, like CVD, cancer, diabetes; and accidental injuries, and communicable diseases, like hepatitis and JE. Subsequent policy would be based on such data generated in future.
    The NHP-2002 emphasizes the need to establish national health accounts, conforming to the 'source-to-users' matrix structure. Also, the policy envisages the estimation of health costs on a continuing basis.

20. **Women's Health:** The Policy commits the highest priority of the central government to the funding of the identified Programs relating to woman's health.

21. **Medical Ethics:** The NHP – 2002 envisages that a common patient should not be subjected to irrational or profit-driven medical regimens. A contemporary code of ethics be notified and rigorously implemented by the Medical Council of India.

22. **Enforcement of Quality Standards for Food and Drugs:** The NHP – 2002 envisages that the food and drug administration will be progressively strengthened, in terms of both laboratory facilities and technical expertise. Food standards will be similar to Codex specifications and drug standards will be at par with the most rigorous ones adopted elsewhere.

23. **Regulation of Standards in Paramedical Disciplines:** The NHP-2002 recognizes the need for the establishment of statutory professional councils for paramedical disciplines to register practitioners, maintain standards of training, and monitor performance.

24. **Environmental & Occupational Health:** This Policy envisages that the independently-stated policies and Programs of the environment-related sectors be smoothly interfaced with the policies and the Programs of the health sector. NHP-2002 envisages the periodic screening of the health conditions of the workers, particularly for high-risk health disorders associated with their occupation.

25. **Providing Medical Facilities to Users from Overseas (Health Tourism):** The NHP-2002 strongly encourages the providing of such health services on a payment basis to service seekers from overseas. Recently large number of patients from overseas are coming to India for treatment (Medical Tourism). Such opportunity must be utilized to development of economy and better health services.

26. **Impact of Globalization on the Health Sector:** Possible threat to health security in the post-TRIPS era, as a result of a sharp increase in the prices of drugs and vaccines has been acknowledged. This policy envisages a national patent regime for the future, which, while being consistent with TRIPS, avails of all opportunities to secure for the country, under its patent laws, affordable access to the latest medical and other therapeutic discoveries. At the same time the government will conforms all commitments made in all international fora – UN, WHO, WTO, etc.

Recent Development

The Prime Minister has launched the Public Health Foundation of India (PHFI), a public-private initiative in the health sector, which seeks to establish world-class public health institutes to train professionals in the field. The PHFI plans to establish five-seven world-class and relevant Indian Institutes of Public Health (IIPH) within the next five years, with the first two institutes opening by 2008. Funding for this project would total nearly Rs 500-700 crore over five to seven years.

ACHIEVEMENTS

Followings goals of national health policy are missed or achievement:

Year	Goals
2003	• Enactment of legislation for regulating minimum standard in Clinical

Establishment /Medical Institutions

2005
- Eradication of Poliomyelitis is missed, however there is zero reporting of yaws since 2004.
- Leprosy has been declared eliminated according to the criteria fixed by WHO. However, more efforts are required.
- Integrated Disease Surveillance Project has been launched but establishment of National Health Accounts and Health Statistics is still lagging behind. IDSP is also going at a slow pace.
- Spending of State Sector Health has not much increased as planned from 5.5% to 7% of the budget.
- Budget for medical research is not much increased as 1% of the total health budget for Medical Research has been targeted.
- Decentralization of implementation of public health Programs: National Rural Health Mission has been launched in this direction.

2007
- Achieve Zero level growth of HIV/AIDS has not been achieved and may required some more years.

COMMENTS

The NHP-2002 is indeed a well thoughtful and comprehensive document. It has highlighted various reasons of failure in the past and has committed various goals and objectives need to be achieved in a given time frame. This document has described detailed review and gains of the National Health Policy 1983. NHP-2002 has got the opportunity to refer many documents and reports like World Development Report 1993, National Family Health Survey 1993-94 and 1998-1999, the Census of India 2001, World Health Report 2000, and favorable environment like support of international health agencies, economic and political reforms particularly 73rd and 74th amendment of the Constitution of India. However, there are many constraints in the implementation of this policy like 35% illiterate and one quarter population is below poverty line, unstable government, and reactive response to the health problem and disasters.

The NHP-2002 is a desirable and positive step for the betterment of people's health. A substantial achievement has been acknowledged by the government as far as the targets are concerned. The need of the time is to provide quality health care with methods which are cost effective, feasible, applicable and implementable.

In-spite of all good things in the policy it also suffer from some criticisms which are as follows:

Goals failed to be achieved by 2005
- Eradicate Poliomyelitis
- Establish an integrated system of surveillance, National Health Accounts and Health Statistics
- Increase State Sector Health spending from 5.5% to 7% of the budget.
- 1% of the total health budget for Medical Research
- Decentralization of implementation of public health Programs

Policy
- This policy does not referred to the Women Empowerment Policy 2001 while describing measures to ensure women health. There is a need to coordinate effectively with the Ministry of Social Justice and Empowerment while dealing with vulnerable section of the society like children, old age, children, scheduled caste, scheduled tribes, etc.
- Women's health has not received enough attention in the policy; similarly child health, adolescents, gender discrimination and violence should have received adequate concerns.
- Old age group has got very less attention in the policy. Expectation of life (Life Expectancy) that is the average number of years an individual of a given age is expected to live if current mortality rates continue to apply. A statistical abstraction based on existing age-specific death rates. *Life Expectancy at birth:* Total person-years lived by the birth cohort divided by the size of the birth cohort. *Life Expectancy at age one:* Total person-years lived by the cohort from the age one divided by the size of the cohort at age one. Life expectancy has cross 60 years of age and going to be 70 in next decade which demands special health services for this group and can not be neglected. Although a separate Old Age Policy is existing but National Health Policy must specify in which areas there is need of coordination and convergence.

- Ignored areas are: Resource generation mechanism, allocation priorities and workforce management, how to handle growing menace of substance abuse, updating of intervention prescribed in national health programs according to scientific development, abolition of private practice by government doctors, controlling medical advertisement, etc.
- Occupational and environmental health should have been addressed properly as far as standards, safety measures and recreational facilities is concerned.
- Who is responsible for coordination of programs activities? Activities specified in National Population Policy 2000 are similar in nature. How these activities would be coordinated to avoid duplication?
- How to control duplication of delivery of health services in many states? Integration of vertical program activities with general health service ensure sustainability. Shifting the role of the workforce from a single program to several general priorities often leads to complacency and non-accountability. States may not be able to support the integrated workforce, with the result that they may neither be keen in filling up the vacancies of these workers nor interested in creating of new posts, if necessary. The present plight of 'multipurpose worker male' is an eye opener in this regard (Nair 2002).
- School Health Programs have not achieved the desired results in the majority of states. The programs have become almost defunct because of administrative, managerial and logistic problems. In recent evaluation by Delhi Government it is clearly found that Government run school health services are not cost effective as compare to run by NGOs. However more studies are required before advocating private agency to run the school health services.
- For decentralization: Role of Local Self-Government Institutions has been defined in the policy and should have achieved by 2005. With the exception of Kerala, decentralization has merely been an attempt to delegate duties rather than devolution of powers. Hence, it is hardly surprising that despite attractive slogans like "people's health in people's hands", the real needs of the people have not been met (Duggal & Priya In. Gangolli et al 2005).

Mismatch situation analysis and Policy Prescriptions

- There is passing comment on strengthening primary health care but how this can be achieved policy has not specified. It is also silent on village health workers.
- Failing to bring Anganwadi Workers and other grass root level workers on one platform;
- Policy does not given importance to population control however, blames the population explosion for nullifying the impact of advancement of public health.
- Policy ignores pharmaceuticals and their impact on health care. There is no mentioned about Drug policy.
- Section 2 titled "Present Scenario" analyses many of the present initiatives and their deficiencies. Some of the conclusions drawn in this section are based on sound assumptions. However, many of these assumptions are ignored or contradicted in the operative part of the document, Section 4 titled "Policy Prescriptions". Another example is encouragement of private sector and legitimization of privatization of the healthcare delivery system (Gupta AS 2002).
- Single most important determinant of health is literacy of the people and investment in primary education is most rational and beneficial (Amartya Sen 1996, Kishore 1999, 2002). Policy does not stressed upon a close working mechanism with department of education neither emphasize more investment on education.
- The impact of globalization may affect the basic philosophy of equity. Heavily subsidized primary healthcare, as it exists in India, would suffer the most. The rural marginalized and poor would be worst sufferers.
- The pharmaceutical sector has witnessed tremendous growth over the past few years, from a turnover of Rs. 5000 crore in 1990 to over Rs. 50,000 crore in 2004-2005. The industry has carved a niche for itself in the international market. Yet drugs continue to be beyond the reach of a very large number of people. The access to medicines for what are life-threatening diseases for people in developing countries is a fundamental human

rights has been violated time and again within the country (Srinivasan In.Gangolli 2005).

Funding

- Increasing from 0.9% to 1.2% of GDP expenditure on health is still lowest among the world countries. This is falls shorts of the 4-5% of GDP that has been a long-standing demand of the health movement and recommended by the WHO. The goal of policy to increase state sector health spending from 5.5% to 7% of the budget by 2005 is failed which is increased in spite of many efforts in the name of universalization of health care. Increased healthcare financing alone will not suffice unless it is backed by accessible and efficient delivery mechanism. The approach has to take into account a package of services, not piecemeal. The increased spending on health alone is insufficient to improve the health indicators. Development of standard treatment guidelines, prescription audit and quality assurance methods are also needed to improve performance, efficiency, and accountability in the public and private sectors.
- The policy should have allocated funds and other resources that can be made available from the health sector in case of disaster or natural calamities.
- Lack of strong steps to ensure sustainability of various Programs.
- The financial autonomy given to district societies bypassing state treasuries and the usual monitoring mechanism may jeopardize professional decision making and may lead to corruption.
- 40% of those seeking in-patient treatment in the public sector services in rural areas and 21% of such people in urban areas are falling into debt due to out-of-pocket expenditure. It is resulting of the so-called health reforms initiated due to pressure exerted by the International Financial Institutions (Dilip In. Gangolli 2005).

Community Participation

- All national Programs demand strong community involvement so that they can be sustained. The policy is rhetoric on community participation but prescribed 'top-down' approach to many national health programs which is contrary to decentralization process. This policy also emphasized good governance at all levels with pure intention to empower people and once again the policy needs dedicated efforts of the people to make it a reality.
- In reference to equity in the policy, for no good reasons, gender, caste and class based inequalities persist in India. Several statistical details have not been given due attention on these issues. For instance, how does one explain the fact that morbidity is marginally higher among females than among males in both rural and urban areas although it is generally noticed that the weaker sections of society do not seek treatment either due to lack of funds or poor health care consciousness. Why those in the lower 25-50 monthly per capita expenditure quartile in both urban and rural areas are more likely to seek health care from the private sector than those in the higher 50-75 monthly per capita expenditure quartile that need to be examined (Dilip In. Gangolli 2005).
- Introduction of user fees has not only adversely impacted general health, but also blocked access to information and therefore awareness. It is unfortunate that user pay persists even though a number of studies have shown that it has never accounted for a substantial part of the budget for public health centers (Gangolli In. Gangolli 2005).

Medical Council of India: Contradictions and Dilution of Standards

- Emphasizing the diversity of health care provider should not lead to an uncontrolled legitimization of larger numbers of questionable health providers especially in the rural areas. Focus should be on providing workable incentives for trained health providers. It is also not true that sufficient number of health professionals is not available. Many reports state that India has a severe shortage of human resources for health. The public health facilities continue to face staff shortage as over 85 percent specialist doctors, 75 percent doctors, 80 percent laboratory technicians, 53 per cent nursing and 52 percent ANM (auxilary nurse midwife) posts are vacant across States. Large number of doctors, nurses and technicians are unemployed and under-employed and should be appropriately utilized otherwise dissatisfaction among them may affect whole medical system.
- Attempts to fill the gaps of manpower shortage by creating a cadre of "licensed Medical Practitioners" (LMPs) was tried in Kerala and

discarded decades back due to its adverse outcomes. The apparent shortage of doctors in rural areas is not due to an absolute shortage of healthcare professionals. Such experiments may led to immense chaos and turbulent situations in the healthcare delivery system, unethical practices and rampant quackery (Nair 2002).

- Posting freshly graduate doctors in rural areas has been failed to bring change and most of the places it is not implemented at all. ROME scheme is also failed. Recommending once again compulsory posting to rural areas may be a futile exercise without adressing the problems associated with rural posting. In one of our focus group discussion it was found that interns wish to go to rural areas provided that their security, minimum facilities for living, career options, incentives are handled first.
- Creating another speciality such as "Family Medicine" is contrary to previous commitment of reorientation of medical education for common people. The NHP 2002 betrays a lack of understanding regarding the need to create a system of medical education oriented to the needs of primary care, and instead is biased towards urban specialist-based healthcare. However, it is silent about the ban of private medical colleges and the need to stop setting up new ones and to regulate these institutions (Gupta AS 2002). Public health speciality should receive high priority which is over due for a long time. It should be providing jobs description and placing these specialists at all administrative level for appropriate utilization. There is a need to strengthen the curriculum by incorporating health administration, practical epidemiology, health policy analysis, gender studies, environmental health, social science, etc.
- Advocating rational use of drugs by physicians of allopathic system only is discriminatory and irrational. It is well known that the practitioners of Alternative Systems of Medicine which are large in numbers in the country also use irrational drug prescriptions;
- Discriminatory approach: Provision of less qualified health personnel like ANM and local less trained practitioners for rural area to deliver health care services. For some years many universities in Rajasthan, Odissa, are running the Bachlor of Community Health Course. Their job careers are not defined by the government. In the name of capacity building for health many such universities are misguiding youth. Such students will never be allowed to practice medicine by Medical Council of India. Policy should clearly spell out remedy of such developments.

Research

- There is no mention of the necessity to regulate medical research and to develop appropriate ethical criteria. There is no emphasis on public health research. The Research initiatives should be more interactive with policies and implementation of health programmes for making health research more relevant to health system and policy. The government should focus on research capacity building and institutional strengthening for research.
- Academic excellence and research activities of medical teachers should be sufficiently rewarded.
- There is mismatched priorities of premier research bodies such as ICMR and the National Institute of Nutrition (Priya In Gangolli 2005).

Monitoring and Evaluation

- Unspecified supervisory and monitoring system and institutions involved to conduct evaluations;

Public Health Discipline

- There should be a central health regulatory authority.
- There should be emphasis on uniform adoption of public health act by the local health authorities.
- Indian Medical and Public Health services should be constituted.
- Public health qualification, such as DPH, MD, PhD in Community Medicine, PSM, Community Health Administration is a must for health administrators at district level.
- Most of the Public health is taught by the Department of Community Medicine, Preventive & Social Medicine. These departments are not given separate funds for community health development projects. Epidemiology and Bio-statistics are taught by specialists of community medicine, whereas statisticians are available in the country but they do not join the medical college because of lack of opportunities and promotional avenues.

Health Tourism (Medical Tourism): public hospitals should also be encouraged to attract medical tourists has been envisaged in this policy but this is problematic because, existing public health facilities are barely able to meet the requirement of the people within the country.

SWOT ANALYSIS

Strength

- Policy identify many gross deficiencies of the existing healthcare scenario, proposes a substantial changes. Justification provided for the new policy are convincing and attempt to accelerate achievement for the set public health goals.
- Commitment to enhance the budget on health expenditure from 5.2% to 6% of GDP with the government contribution increasing from 0.9% to 2% by 2010.
- Availability of advance technology and proven public health strategies.

Weakness

- Lack of monitoring and evaluation.
- Lack of government expenditure on public health.
- Gap in situation analysis and policy prescription.

Opportunity

- Based on past experience of National Health Policy 1983 and long history of implementation of various programs, India get this opportunity to move ahead in health through Health Policy 2002.
- Supportive environment and absence of obvious threat of war, unrest, etc.
- Policy initiative will provide a new impetus to the 'development of the health sector'.

Threats

- Health tourism will drain the trained manpower to private sector and will encourage privatization. In absence of regulation on private sector the encouragement could be dangerous for the public health. However, policy proposes regulation of the private sector but how and when is not described in detail. Private expenditure is already more in India as compare to other countries in the world.
- Occurrence of unexpected natural calamities and catastrophes.
- Negative involvement of religious fundamentalists, for example polio sterility myth impending pulse polio program (Kishore 2003).
- Creation of a cadre of 'half baked paramedical doctors' is strengthening quackery.
- Financial autonomy of district societies may lead to corruption and need to be put under strict outer regulation and accountability.

HEALTH / MEDICAL TOURISM

Medical Tourism may be defined as the provision of cost-effective medical care with due consideration to quality in collaboration with tourism industry for foreign patients who need specialized treatment and surgery. Medical tourism is thousands of years old service sector. In ancient Greece, pilgrims and patients came from all over the Mediterranean to the sanctuary of the healing God, Asklepios, at Epidaurus. In Romed Britain, patients took the waters at a shrine at bath – a practice that continued for 2000 years . From the eighteenth century, wealthy Europeans travelled to Spas from Germany to the Nile. More than 5000 years ago, it was believed that souls return to the earth in a different form to right the wrongs of their past life in Hinduism. A three – dimensional purification of the soul is necessary to discharge the sins of each birth – in physical, mental and spiritual planes. Yoga, meditation, pleasant demeanour and physical cleansing – all part of Ayurveda – serve as a tools for purifying the soul, so future reincarnation will be necessary. In the 21st century, relatively low-cost jet travel has taken the industry beyond the wealthy and desperate. Later, mostly wealthy people began travelling to tourist destinations like the Swiss lakes, the Alps and special tuberculosis sanatoriums, where professional and often specialized medical care was offered. In this century, however, medical tourism expanded to much larger scale. Thailand, followed by India, Puerto-Rico, Argentina, Cuba and others quickly became the most popular destinations for medical tourists. Complicated surgeries and dental works, kidney dialysis, organ transplantation and sex changes, topped the list of the most popular procedures.

The ultimate concept of medical tourism is a tour to surrounding destination, medical treatment and savings. People from advanced countries, including the United States and Europe, see a benefit in travelling to developing third world countries, like India, Thailand, Philippines, South Africa, etc.while combining medical treatments with inexpensive vacation. The key competitive advantages of India is medical tourism

stem from its low cost advantage, strong reputation in the advanced healthcare segment such as cardiovascular surgery, organ transplants, eye surgery and diversity of tourist destinations available in the country. That is why not only from developed but patients from developing countries like Bangladesh, Iran and Pakistan are coming where treatment may not be available.

Now, health tourism or the feeling of wellness is a new emerging concept. Spas, stress relief, centers for rejuvenation are different services growing in demand. Foreigners are attracted to Indian Systems of Medicine (ISM) and tourism. The Indian Systems of Medicine include Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy together characterized under the department of AYUSH in the union health and family welfare ministry. Kerala has pioneer health tourism in India. Kerala has strongly focused on Ayurveda and its wide array of treatments and medications, good facilities are also available in other traditional forms of medicine as well as in modern medical treatment. Kerala is Capitalizing on its Rich Cultural Heritage and alternate Medical Therapies.

The Indian health care market according to industry sources is reported to be growing at over 30% annually. A recent McKinsey study on health care says medical tourism alone can contribute Rs. 5,000-Rs. 10,000 crore additional revenue for up market tertiary hospital by 2012 and will account for 3-5 percent of the total health care delivery market. Compared to western countries it is documented that surgical procedures like heart bypass surgery or angioplasty come at a fraction of the cost in India, with renowned qualified doctors and state of the art medical equipment. The tourist inflow for a wide medical service spectrum from wellness tourism to surgery and rehabilitation has made all interested tap the unexploited potential.Cost of weight lossing surgery is $500-800 in India while in the US it is as high as @ 25000-30000. Liver transplant $ 1.5 lakh in Europe but just $ 45000 in India, heart surgery $ 4500 in India would be $ 45000 in the US.

The ministry of health and family welfare and ministry of tourism are evolving strategies to give a strategic push to open the Indian Healthcare Sector to foreign tourists. The ministry is also considering setting up of a National Accreditation Board for Hospitals. The policies adopted by other countries for accreditation of their hospitals are also being examined to gain from their experiences in taking this forward in India.

Some measures for rationalizing the flow of tourist traffic have already been taken. It has been decided that there should be a fast track clearance for the medical patients at the airport. Earlier foreigners coming to India for medical treatment were being granted visa is non-convertible, non-extendable and valid only for a period of six months, reports of difficulties being faced has been received. To resolve this, Ministry of home affairs has introduced a new category of visa "Medical Visa", which can be given for specific purpose to foreign tourists coming to India for medical treatment. However, such move may be a security treat to India.

The health tourism market in India, estimates at Rs. 15.48 billion in 2004, grew by about 25% and is predicted to become a Rs. 93 billion a year business opportunity by 2012. A mere decade ago, hardly 10,000 foreign patients visited India for medical treatment; in 2004, approximately 180,000 patients arrived from across the globe. India has also become increasingly open to foreign direct investment in the health sector.

Comments

Swot analysis provide us a clear vision of our strengths and weaknesses and how we can use our opportunities (Chakravarthy et al 2008).

Strengths: A strength is an inherent capacity which an organization can use to gain strategic advantage. An example of a strength is superior research and development for a new service industry development so that the industry can gain a strategic advantage. The strengths in medical tourism are:

1) Quality and Range of Services: India has number of hospitals offering world class treatments in nearly every sector such as cardiology, cardiothoracic surgery, joint replacement, orthopaedic surgery, gastroenterology, ophthalmology, transplants, urology, Neurology, Neurosurgery, Oncology, Ophthalmology, Rheumatology, Endocrinology, etc.,

2) Affordable costs- India offers quality treatment at a fifth of the cost abroad. Price advantage is, of course a major selling point. The slogan, thus is ' First World Treatment at Third World Prices'.

3) Vast supply of qualified doctors, nurses & paramedics with required specialization and expertise and the language advantage (English speaking skills).
4) Strong presence in advanced health care, e.g. Cardiovascular, Organ transplants-high success rate in operations.
5) International Reputation of hospitals and Doctors.
6) Diversity of tourism destinations and experiences.
7) Top class luxury resorts, a wonderful blend of traditional architecture, natural beauty and great service and as close to nature.

Weakness: A weakness is an inherent limitation or constraint which creates strategic disadvantages. An example of a weakness is overdependence on a single service line, which is potentially risky for a service industry in times of crisis. The weakness are as follows : 1) No strong government support/ initiative to promote medical tourism.
2) Low coordination between the various players in the industry- airline operators, hotels, and hospitals.
3) Lack of uniform pricing policies across hospitals.
4) Cheating, and
5) Political problems, etc.

Opportunities: An opportunity is a favorable condition in the service industry which enables it to consolidate and strengthen its position. The following are opportunities in medical tourism:
1) Increased demand for healthcare services from countries with aging population (US, UK).
2) Fast-paced life style increases demand for wellness tourism and alternative cures.
3) Shortage of supply in National Health Systems in countries like UK, Canada.
4) Demand from countries with underdeveloped healthcare facilities.
5) Demand for retirement homes for elderly people especially Japanese.
6) Personal touch by the doctors in India.
7) Traffic system is well developed and easy to go from one country to another country.
8) Medicines and labor cost is low as compared to developed countries.
Threats: A threat is an unfavorable condition in the industry's environment which creates a risk for, or causes damage to, the industry. They are :
1) Strong competition from countries like Thailand, Malaysia and Singapore.
2) Lack of international accreditation – a major inhibitor.
3) Overseas medical care not covered by insurance providers.
4) Under – investment in health infrastructure.
5) Exorcism is more in India, foreigners may be attached.
6) Identifying a real practitioner is a major problem in India.
7) Exploitation of tourists by illegal money changers.
India - Strategic Thrusts for the Future
The role of Indian Government for success in medical tourism is twofold: 1) Acting as a Regulator to institute a uniform grading and accreditation system for hospitals to build consumers' trust. 2) Acting as a Facilitator. for encouraging private investment in medical infrastructure and policy-making for improving medical tourism.

For facilitating investment the policy recommendations include:

- Recognize healthcare as an infrastructure sector, and extend the benefits Under sec 80-IA of the IT Act. Benefits include tax holidays for five years and concessional taxation for subsequent five years.
- The government should actively promote FDI in healthcare sector.
- Conducive fiscal policies - providing low interest rate loans, reducing import/excise duty for medical equipment.
- Facilitating clearances and certification like medical registration number, antipollution certificate etc.

For facilitating tourism the government should:

- Reduce hassles in visa process and institute visa-on-arrival for patients.
- Follow an Open-Sky policy to increase inflow of flights into India.
- Create Medical Attachés to Indian embassies that promote health services to prospective Indian visitors.

TELEMEDICINE

Telemedicine can be defined as the use of telecommunications technologies that provide and support health care when distance separates the participants. Other applications, such as telesurgery, involve exotic technologies and procedures that are

still in the experimental stage. In between are applications that employ telemetry, patient monitoring in the home, teleradiography, and consultations involving all manner of voice, image, and video configurations. Telemedicine consultation is involved the image of two-way high resolution video interaction for clinical consultation. This is also provide help in preparedness and population based public health. Interactive telemedicine consultations have been instrumental in saving the lives of soldiers and injured civilians. Rural doctors can reach medical specialists using secure web-based links transmitting voice, video, enabling them to make more accurate assessments for patient management. Patient travel time, effort, and expense are also significantly reduced. Emergency care has been benefitted as well. Swift consultation by emergency doctors can determine the need for trauma team mobilization or air evacuation. By reducing the need for helicopter transport, telemedicine can greatly reduce the cost of emergency care (Harr et al 1997).

Eleventh Plan

With its huge area of 32,87,268 Sq km, population of 1.4 billion, urban-rural divide, inaccessible hilly regions, islands and many tribal areas, India is an ideal setting for telemedicine assisted health care delivery. Growing number of medical, paramedical colleges and schools with lack of adequate infrastructure, learning materials and teachers needs is a matter of grave concern. E-health technology has the potential to create a national level GRID which can form the backbone to be shared by healthcare providers, trainers and beneficiaries. A strong fiber backbone and indigenous satellite communication technology in place with large mass of human potential trained in IT and local presence of telepathy industry, e-health application and implementation should not be a problem technically. Further a number of pilot projects over last five years with successful outcome stand to its testimony. Groundwork on telemedicine in the country has already been laid with the efforts of ISRO and Information Technology department partnering with many State Government and specialty Institutes/hospitals. Policy standardization and infrastructural issues have already been researched. Professional societies on telemedicine/e health have been active. Print and electronic media are participating in awareness campaign.

WHO has adopted "strategy 2004-2007 e-health for health care delivery" and similarly Government of India is following the same strategy. Following initiatives and activities are the witness of development of Telemedicine in India:

1. Indian Space research Organization (ISRO) Initiatives: ISRO telemedicine pilot project was started in the year 2001 as a part of proof-of-concept demonstration program. Telemedicine system consists of customized medical software integrated with computer hardware along with medical diagnostic instruments connected to the commercial VSAT at each location. The medical record/history of the patient is sent to specialist doctors, who study and provide diagnosis and treatment during videoconference with patient's end.

During the year, telemedicine network has been further expanded and it now covers 100 hospitals- 78 remote/ rural/district hospitals/ health centre connected to 22 super specialty hospitals located in the major cities as follows:

- Nine hospitals in Jammu and Kashmir, six district hospitals including Leh and Kargil and three medical college hospitals connected to All Indian Institute of Medical Sciences, Delhi, Apollo Hospitals, Delhi and Amrita Institute of Medical Sciences, Kochi.
- Five islands of Lakshdweep (Kavaratti, Amini, Agatti, Andrott and Minicoy) connected to Amritha Institute of Medical Sciences, Kochi.
- Five remote /field/base hospital of Indian Army connected to research and referral (R&R) Hospital at New Delhi. INHS, Dharvantri under the naval Command at Port Blair, Andmans connected to R&R Hospital, New Delhi.
- Eleven hospitals of North Eastern States (STNM Hospital Gangtok, Sikkim regional Institute of Medical Sciences, Imphal, Manipur Medical College Hospital, Guwahati and District Hospital at Udaipur, Tripura) connected to Asia Heart Foundation, Kolkata.
- Tata Memorial Cancer Centre, Mumbai connected to B B Barua Cancer Centre, Guwahati and Wal Waker Rural Cancer Centre at Chiplun, Maharashtra.
- Three Medical College Hospital of Orissa connected To SGPGI, Lucknow.

- Operational telemedicine network in Karnataka –11 district / taluk hospitals connected to five super speciality hospitals in Bangalore and Mysore.

Besides the above, a temporary facility and a mobile teleopthalmology facility has been provided. Operational telemedicine network is being established at Chhatisgarh connecting 14 district hospitals/health centers to Raipur Medical College Hospitals. Thousands of patients have got consultations with significant improvement of satisfaction.

NATIONAL HEALTH POLICY 2015 (Draft)

Introduction:

India today, is the world's third largest economy in terms of its Gross National Income (in PPP terms) and has the potential to grow larger and more equitably, and to emerge to be counted as one of the developed nations of the world. India today possesses as never before, a sophisticated arsenal of interventions, technologies and knowledge required for providing health care to her people. Yet the gaps in health outcomes continue to widen. On the face of it, much of the ill health, disease, premature death, and suffering we see on such a large scale is needless, given the availability of effective and affordable interventions for prevention and treatment. "The reality is straightforward. The power of existing interventions is not matched by the power of health systems to deliver them to those in greatest need, in a comprehensive way, and on an adequate scale".

This National Health Policy addresses the urgent need to improve the performance of health systems. The National Health Policy of 1983 and the National Health Policy of 2002 have served us well, in guiding the approach for the health sector in the Five-Year Plans and for different schemes, Now 13 years after the last health policy, the context has changed in four major ways:

1- Health Priorities are changing. As a result of focused action over the last decade we are projected to attain Millennium Development Goals with respect to maternal and child mortality. Maternal mortality now accounts for 0.55% of all deaths and 4% of all female deaths in the 15 to 49 year age group and demands that the commitments to further reduction. There are many infectious diseases which the system has failed to respond to. Then there is a growing burden of non-communicable disease. 2

2- The emergence of a robust health care industry growing at 15% compound annual growth rate (CAGR). This represents twice the rate of growth in all services and thrice the national economic growth rate.

3- Incidence of catastrophic expenditure due to health care costs is growing and is now being estimated to be one of the major contributors to poverty.

4- Economic growth has increased the fiscal capacity available. Therefore, the country needs a new health policy that is responsive to these contextual changes.

The primary aim of the Policy

To inform, clarify, strengthen and prioritize the role of the Government in shaping health systems in all its dimensions investment in health, organization and financing of healthcare services, prevention of diseases and promotion of good health through cross sectoral action, access to technologies, developing human resources, encouraging medical pluralism, building the knowledge base required for better health, financial protection strategies and regulation and legislation for health.

Achievement and challenges: From a baseline of 560 in 1990, the MMR is reduced to 178 by 2010-12 and at this rate of decline is estimated to reach an MMR of 141 by 2015. Under-5 mortality rate (U5MR) from a baseline of 126 in 1990, in 2012 it is 52. The rate of decline of still-births and neonatal mortality has been lower than the child mortality on the whole. The Crude Birth Rate (CBR) is less than 21 per 1000. The national TFR has declined from 2.9 to 2.4. But there is high degree of health inequity in health outcomes and access to health care services.

The situation in quality of care is also a matter of serious concern and this seriously compromises the

effectiveness of care. India's progress on communicable disease control is mixed. The most acclaimed success of this period is the complete elimination of polio. In Leprosy too there have been significant reductions, but after a reduction of an annual incidence of 120,000 cases, there is stagnation, with new infective cases and disabilities being reported. Kala-azar and Lymphatic filariasis are expected to decline. In AIDS control, progress has been good with a decline from a 0.41 % prevalence rate in 2001 to 0.27% in 2011- but this still leaves about 21 lakh persons living with HIV, with about 1.16 lakh new cases and 1.48 deaths in 2011. In tuberculosis the challenge is a prevalence of close to 211 cases and 19 deaths per 100,000 population and rising problems of multi-drug resistant tuberculosis. In malaria there has been a significant decline, but there are also the challenges, of resistant strains developing and of sustaining the gains, in a disease known for its cyclical reemergence and focal outbreaks. Viral Encephalitis, Dengue and Chikungunya are on the increase, particularly in urban areas and as of now we do not have effective measures to address them. Performance in disease control programmes is largely a function and reflection of the strengths of the public health systems. Where there are sub-critical human resource deployment, weak logistics and inadequate infrastructure, all national health programmes do badly. Non-communicable diseases (39.1%) and injuries (11.8%) now constitute the bulk of the country s disease burden but coverage and scope is limited except Blindness control programme.

The private sector today provides nearly 80% of outpatient care and about 60% of inpatient care. 72% of all private health care enterprises are own-account-enterprises (OAEs), which are household run businesses without hiring a worker on a fairly regular basis.

There has been considerable expansion of AYUSH services since 2002 particularly in private sector. India has the potential to become a world leader in this sphere, given adequate support for research and institution building.

Human Resource Development: The last ten years have seen a major expansion of medical, nursing and technical education. For example, in nursing this has led to 1050 ANM courses, 1541 GNM courses, 1160 graduate nursing schools, and 388 post-graduate nursing schools being set up. But there is hardly any improvement in rural orientation of these courses. Funding in health research is poor where is there is lot of potential to conduct research in medical college,

Table 43.6: Disparities in health outcomes:

Indicator	India			
	Total	Rural	Urban	% differential
TFR (2012)	2.4	2.6	1.8	44% difference
IMR (2012)	40	44	27	63% difference

Indicator	States with Good Performance	States with greater challenges
TFR (2012)	HP (1.7), Punjab (1.7), Tamil Nadu (1.7) and West Bengal (1.7)	Bihar (3.5), UP(3.3), Rajasthan (2.9), MP(2.9)
IMR (2010)	Kerala(12), Tamil Nadu(21), Delhi(24), Maharashtra(24)	Madhya Pradesh (54), Assam (54), Orissa (51), Rajasthan (47)
MMR(2010-12)	Kerala (66), Maharashtra (87), Tamil Nadu (90), Andhra Pradesh (110)	Assam (328), Uttar Pradesh /Uttarakhand (292), Rajasthan (255), Odisha (235)

Table 43.7: Comperative Health expenditure in the world

Country	Total Health Exp per capita (USD) - 2011	Total Health Exp as % of GDP - 2011	Govt. Health Exp as % of Total Health Exp - 2011	Life Expectancy at birth (years) 2012
India	$62	3.9%	30.5%	66
Thailand	$214	4.1%	77.7%	75
Sri Lanka	$ 93	3.3%	42.1%	75
BRIC Countries				
Brazil	$ 1119	8.9%	45.7%	74
China	$ 274	5.1%	55.9%	75
Russia	$803	6.1%	59.8%	69
South Africa	$670	8.7%	47.7%	59
OECD Countries				
USA	$ 8,467	17.7%	47.8%	79
United Kingdom	$ 3,659	9.4%	82.8%	81
Germany	$ 4,996	11.3%	76.5%	81
France	$ 4,968	11.6%	76.8%	82
Norway	$ 9,908	9.9%	85.1%	82
Sweden	$ 5,419	9.5%	81.6%	82
Denmark	$ 6,521	10.9%	85.3%	80
Japan	$ 4,656	10%	82.1%	84

nursing and AYUSH. Regulatory role of government on drugs, medical, nursing and other related educational courses and services is challenging. Private players are concerned about their growth and development.

Investment in Health Care is remained low in spite of pronouncement of the National Health Policy 2002 articulated in the 10th , 11th and 12th Five Year Plans, and the NRHM framework to increase public health expenditure to 2 to 3 % of the GDP. The total spending on healthcare in 2011 in the country is about 4.1% of GDP. The Government spending on healthcare in India is only 1.04% of GDP which is about 4 % of total Government expenditure, less than 30% of total health spending. This translates in absolute terms to Rs. 957 per capita at current market prices. The Central Government share of this is Rs. 325 while State Government share translates to about Rs. 632 on per capita basis at base line scenario Table 43.7.

Two nations, Brazil and Thailand, are considered to have achieved close to universal health coverage- Thailand has almost the same total health expenditure as India but its proportion of public health expenditure is 77.7% of total health expenditures (which is 3.2 % of the GDP). Brazil spends 9% of its GDP on health but of this public health expenditure constitutes 4.1 % of the GDP (which is 45.7% of total health expenditure). This public health expenditure accounts for almost 75 % of all health care provision. It would be ambitious if India could aspire to a public health expenditure of 4% of the GDP, but most expert groups have estimated 2.5 % as being more realistic.

Goal: The attainment of the highest possible level of good health and well-being, through a preventive and promotive health care orientation in all developmental policies, and universal access to good quality health care services without anyone having to face financial hardship as a consequence.

Principles: (1) Equity: mean affirmative action to reach the poorest and minimizing disparity on account of gender, poverty, caste, disability, other forms of social exclusion and geographical barriers. (2) Universality: Systems and services are designed to cater to the entire population- not only a targeted sub-group. (3) Patient Centered & Quality of Care: Health Care services would be effective, safe, and convenient, provided with dignity and confidentiality with all facilities across all sectors being assessed, certified and incentivized to maintain quality of care. (4) Inclusive Partnerships: widest level of partnerships with academic institutions, not for profit agencies and with the commercial private sector and health care industry to achieve these goals. (5) Pluralism: Patients who so choose and when appropriate, would have access to AYUSH care providers based on validated local health traditions. (6) Subsidiarity; (7) Accountability: Financial and performance accountability, transparency in decision making, and elimination of corruption in health care systems would

be essential. (8) Professionalism, Integrity and Ethics: Health workers and managers shall perform their work with the highest level of professionalism, integrity and trust and be supported by a systems and regulatory environment that enables this. (9) Learning and Adaptive System: constantly improving dynamic organization of health care which is knowledge and evidence based, reflective and learning from the communities they serve, the experience of implementation itself, and from national and international knowledge partners. (10) Affordability: As costs of care rise, affordability, as distinct from equity, requires emphasis.

Objectives: (1) Improve population health status through concerted policy action in all sectors and expand preventive, promotive, curative, palliative and rehabilitative services provided by the public health sector. (2) Achieve a significant reduction in out of pocket expenditure due to health care costs and reduction in proportion of households experiencing catastrophic health expenditures and consequent impoverishment. (3) Assure universal availability of free, comprehensive primary health care services, as an entitlement, for all aspects of reproductive, maternal, child and adolescent health and for the most prevalent communicable and non-communicable diseases in the population. (4) Enable universal access to free essential drugs, diagnostics, emergency ambulance services, and emergency medical and surgical care services in public health facilities, so as to enhance the financial protection role of public facilities for all sections of the population. (5) Ensure improved access and affordability of secondary and tertiary care services. (6) Influence the growth of the private health care industry and medical technologies to ensure alignment with public health goals, and enable contribution to making health care systems more effective, efficient, rational, safe, affordable and ethical.

Policy Directions:

This policy proposes a potentially achievable target of raising public health expenditure to 2.5 % of the GDP. It also notes that 40% of this would need to come from Central expenditures. At current prices, a target of 2.5% of GDP translates to Rs. 3800 per capita. Creation of a health cess on the lines of the education cess for raising the necessary resources or mobilise contributions from specific commodity taxes- such as the taxes on tobacco, and alcohol, from specific industries and innovative forms of resource mobilization. Corporate social responsibility has now been made mandatory- and this avenue should be maximally leveraged.

The policy mandates the MoHFW to provide a roadmap for a series of coordinated policy initiatives and practical actions, to be implemented across all sectors ("Health In All" approach as complement to Health For All) for preventive and promotive health.

Cross-sectoral, multilevel interventions that involve sectors such as food and nutrition, education, safe drinking water and sanitation, housing, employment, industrial and occupational safety, welfare including social protection, family and community services, tribal affairs and communications are required. The Government has an obligation to build community support and capacity to enjoy good health. The Village Health Sanitation and Nutrition Committees should be promoted even in urban areas. The Swachh Bharat Abhiyan, which is already in place, would be supported, and whose success would be measured by the reduction of water and vector borne diseases and declines in improperly managed solid waste. Balanced and Healthy Diets would be promoted through action in Anganwadi centers and schools. Tobacco, Alcohol and Substance Abuse (*Nasha Mukti Abhiyan*) would be implemented.

Yatri Suraksha means deaths due to rail and road traffic accidents should decline by ensuring road and rail safety. *Nirbhaya Nari-* Action against gender violence ranging from sex determination, to sexual violence would be addressed. Reduced stress and improved safety in the work place would include action on issues of employment security, preventive measures at the work place including adequate exercise and movement, and occupational health- strengthening understanding of occupational disease epidemiology and demonstrate measurable decreases. Action would be taken on reducing indoor and outdoor air pollution.

Health in all approach could be popularized as the Swasth Nagrik Abhiyan- a social movement for health. The policy recognizes the need for the holistic approach and cross sectoral convergence in addressing social

determinants of health. A good disease surveillance system would pick up outbreaks of water-borne disease and link it to specific sanitation failures.

This policy envisages not only extending the coverage and quality of existing services but also extending the package of family and community level preventive and promotive health care services to include early detection and response to early childhood development delays and disability, adolescent and sexual health education, behaviour change with respect to tobacco and alcohol use, screening, counselling for primary prevention and secondary prevention for common chronic illness- both communicable and non-communicable. Of these programmes greater investment and action is required in school health. Promotion of Yoga at the work-place, in the schools and in the community would also be an important form of health promotion that has a special appeal and acceptability in the Indian context.

Occupational Health also requires greater emphasis. Work-sites and institutions must be encouraged and monitored to ensure safe health practices and accident prevention, and provide preventive and promotive services.

The ASHA will be supported to undertake primary prevention for non-communicable diseases, in palliative care and community mental health, through health promotion activities, working with care givers and the Village Health Sanitation and Nutrition Committees.

Wider involvement of stakeholders includes elected local governments, local communities and community based organisations like self-help groups, students of schools and colleges, non-government organizations, professional organizations, and corporate social responsibility mechanisms. Taken together these could constitute a "Social Movement for Health".

Convergence with sectors such as nutrition, education, water and sanitation, agriculture, housing, labor etc. across each stage of the planning cycle, and inter-departmental convergence, for synergistic improvement of health status is envisaged. The policy also recommends the setting up of seven "Task Forces" for formulation of a detailed "Preventive and Promotive Care Strategy" in each of the seven priority areas for preventive and promotive action.

Organization of Public Health Care Delivery: From a Selective Care that is fragmented from secondary/ tertiary care to Assured Comprehensive care that has continuity with higher levels. Facilities which start providing the larger package of comprehensive primary health care will be called health and wellness centers. In Public Hospitals assured Free Drugs, Diagnostic and Emergency Services should be available. In Urban areas an upgraded healthcare services should be made available. AYUSH will be mainstreamed. Even for the health security of the nation, as brought out in our response to disasters and even in our recent preparedness against Ebola virus, public health care systems must retain a certain excess in terms of health infrastructure, human resource and advanced technological capacity that can be mobilized in times of crisis. However all national health programmes require, that for effective implementation they are well integrated with state health systems and for efficient functioning must contribute to strengthening state health systems meaningfully.

The PHC team plays an important role in averting disease, counseling, guiding and educating people and enables them to adopt healthy life styles and make better health and healthcare related choices.

India should have at least 1000 beds per million population (1 per 1000) and they should be distributed such that within what is known as the golden hour- a secondary care facility can be accessed. But where distance is a barrier, new hospitals of the standard CHC model- with 30 beds would have to be strengthened with necessary skilled staff including specialist skills. However if hospitals become very large- then also they could become inefficient and new hospitals would need to be constructed beyond a threshold level of say 1000 beds. A minimum population to bed ratio should be at least 1000 beds per million population- with corresponding human resources and equipment to match.

Universal Immunization Programme: Health Technology Assessment and building up the national epidemiological information base required for decision making and monitoring would be of immense value for introduction of new vaccines.

Population Stabilization including maintaining a gender balance has been and will continue to be one of the main components of national health policy. Women' Health & Gender Mainstreaming is envisaged. There is a need to build sufficient public health capacity down to the district level with a network of well-equipped laboratories backed by tertiary care centers and the public health capacity to collect, analyze and respond to the disease outbreaks using the state of the art public health knowledge.

The communicable diseases that national health programmes address include three chronic diseases- HIV, tuberculosis and leprosy, plus all the vector borne diseases, and the expanded programme of immunization, and NCDs should have integrated approach for capacity building and infrastructure development and for health promotion and preventives activities.

For the elderly population more community-centered approach with family support and good continuity of care at higher levels is planned. Palliative care will be made available at various levels.

Policy focuses on the increase in creation of mental health specialists with public financing and integration with the primary care and refers mentally ill to the appropriate site and follows up with medication and tele-medicine linkages.

A network of emergency care that has an assured provision of life support ambulances linked to trauma management centers- one per 30 lakh population in urban and one for every 10 lakh population in rural areas will form the key to a trauma care policy.

Expand the capacity to provide tertiary care services consisting of strengthening 58 medical colleges in the first three phases, upgrading 58 district hospitals to become medical colleges and building up close to 15 more new AIIMS. Connectivity provided by National Knowledge Network shall be networked for tele-education, tele-CME, tele-consultations and access to digital library. E-Health could also facilitate medical consultation with specialists, capacity building of health care workers/ professionals, and improve program monitoring and supervision, and delivery of emergency care. National e-Health Authority (NeHA) will be set up to provide leadership in implementation of the integrated health information system, to promote adoption of standards and facilitate exchange of patients health records across facilities in a secure way.

Ensuring that doctors are attracted to work in remote areas and that their services can be retained there also requires specific policy measures. There are very few institutions providing specialized nursing courses. It is very important that specialized tertiary level medical care is supported with specialized nursing and Para-medical care. Tertiary care facilities like critical care, cardio-thoracic vascular care, neurological care, trauma care, etc. requires specialized knowledge and skills. The policy recognizes the need for developing training courses and curriculum in these areas. Besides many courses such as BSc community health, medical and paramedical specialization, the ASHA should be promoted the community health nurse or Facilitator. One approach has been initiated with the certification programme for ASHA under the National Open School System which will serve as a benchmark, for preferential selection of the ASHA into ANM, nursing and paramedical courses for deployment in Health and Wellness centres; for more advanced skill community based geriatric and palliative care. Centers of Excellence for Nursing and Allied Health Sciences would also be established in each State. Nursing cadre within public service requires both career progression opportunities as well as specialization in areas like public health nursing and clinical specialties. There is a similar need to have a planned expansion of allied technical skills radiographers, laboratory technicians, physiotherapists, pharmacists, audiologists, optometrists etc. There is a need to create a Public Health Management Cadre in all States which would be based on public health or related disciplines as an entry criteria, an appropriate career structure and recruitment policy to attract young and talented multi-disciplinary professionals committed to prevention and health promotion. Doctors with public health training would form a major part of this, but professionals coming in from diverse backgrounds such as sociology, economics, anthropology, nursing, hospital management, communications, etc. who have since undergone public health management training would also be considered.

To ensure quality of Medical Education, a common entrance exam on the pattern of NEET for UG entrance at All India level needs to be enforced. A Licentiate Exam will be introduced for all medical graduates with a regular renewal at periodic intervals with CME credits accrued.

The Institutional Framework: The main challenge at both Center and the States is strengthening the synergistic functioning of the directorate as the technical leadership and the civil services as the administrative leadership and coordinating both of these with the increasing number of State owned or fully state financed corporations, and registered societies and autonomous or semi-autonomous institutions. Directorates need to be strengthened by HR policies, central to which is that, those from a public health management cadre must hold senior positions in public health. In all directorates, senior personnel need to have been groomed into leadership roles by experience of policy and administrative work, before they come to occupy key positions. Civil servants too should have clear induction and orientation programmes in the domain as also general understanding of institutional processes that they need to put in place so that the directorates and various state owned institutions in a knowledge based sector are able to perform optimally.

Legal Framework for Health Care and the Right to Health: Laws under review include the Mental Health Bill, the Medical Termination of Pregnancy Act, the bill regulating surrogate pregnancy and assisted reproductive technologies, Food Safety Act, Drugs and Cosmetics Act and the Clinical Establishments Act. The process of aligning many of these laws to meet our needs and changed circumstances and understanding becomes one of the urgent tasks in the coming years. The policy also envisaged that the Center should enact, a National Health Rights Act, which will ensure health as a fundamental right.

A Policy is only as good as its implementation. Past policies, have faced innumerable constraints in implementation. The National Health Policy therefore envisages that an implementation framework be put in place to deliver on these policy commitments.

Comments:

1. No specific mention of HIV and TB collaboration in document which is increasing becoming important
2. Not much focus on Public Health Emergencies of International Concern (PHEIC) like ebola, swine flu preparedness and control. Nothing is mentioned for steps to be taken for control of such emerging diseases and international collaboration
3. Health Financing- Nothing is mentioned for health insurance for unorganized sector
4. Health literacy- From the study we have found that the health literacy is poor which is pre-requisite for health seeking behaviour and compliance but no policy decision is taken to improve health literacy of the public.n
5. Mechanism for evaluation of all programs at regular interval not given. Without policy on evaluation of schemes and programs no one made attempt to do it therefore no impact or effectiveness can be measured for amount of money we spent on them.
6. Audit- Only NRHM has provision of audit. It should rather be a part of all national health programs. different types of audits like safety audit, clinical audit, dealth audit should be promoted
7. Social Marketing- Studies have shown promising role of social marketing in health sector. the concept should be promoted.
8. Disability- Nothing is mentioned for prevention and rehabilitation of disabled people. Newer strategies for diagnosis, management and rehabilitation and research should be promoted.
9. Elderly- age friendly cities concept should be promoted.
10. Medical Education and capacity building: Standards and accreditation of medical and nursing colleges including AYUSH will improve quality of care. Policy does not look at the updating of a large number of doctors working as GP'S, the policy does not at all cater to their academic or skill updating.
11. Involvement of general practitioners in various national programs to ensure quality and universal coverage is urgently required.

The Pradhan Mantri Swasthya Suraksha Yojana (PMSSY)

The Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) aims at correcting the imbalances in the availability of affordable healthcare facilities in the different parts of the country in general, and augmenting facilities for quality medical education in

the under-served States in particular. The scheme was approved in March 2006.

The first phase in the PMSSY has two components - setting up of six institutions in the line of AIIMS; and upgradation of 13 existing Government medical college institutions.

It has been decided to set up 6 AIIMS-like institutions, one each in the States of Bihar (Patna), Chattisgarh (Raipur), Madhya Pradesh (Bhopal), Orissa (Bhubaneswar), Rajasthan (Jodhpur) and Uttaranchal (Rishikesh) at an estimated cost of Rs 840 crores per institution. These States have been identified on the basis of various socio-economic indicators like human development index, literacy rate, population below poverty line and per capital income and health indicators like population to bed ratio, prevalence rate of serious communicable diseases, infant mortality rate etc. Each institution will have a 960 bedded hospital (500 beds for the medical college hospital; 300 beds for Speciality/Super Speciality; 100 beds for ICU/ Accident trauma; 30 beds for Physical Medicine & Rehabilitation and 30 beds for Ayush) intended to provide healthcare facilities in 42 Speciality/Super-Speciality disciplines. Medical College will have 100 UG intake besides facilities for imparting PG/doctoral courses in various disciplines, largely based on Medical Council of India (MCI) norms and also nursing college conforming to Nursing Council norms.

In addition to this, 13 existing medical institutions spread over 10 States will alsobe upgraded, with an outlay of Rs. 120 crores (Rs. 100 crores from Central Government and Rs. 20 crores from State Government) for each institution. These institutions are Government Medical College, Jammu, Jammu & Kashmir Government Medical College, Srinagar, Jammu & Kashmir, Kolkatta Medical College, Kolkatta, West Bengal, Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow, Uttar Pradesh, Institute of Medical Sciences, BHU, Varanasi, Uttar Pardesh, Nizam Institute of Medical Sciences, Hyderabad, Andhra Pradesh, Sri Venkateshwara Institute of Medical Sciences, Tirupati, Andhra Pradesh, Government. Medical College, Salem, Tamil Nadu, B.J. Medical College, Ahmedabad, Gujarat, Bangalore Medical College, Bangalore, Karnataka, Government Medical College, Thiruvananthapuram, Kerala, Rajendra Institute of Medical Sciences (RIMS), Ranchi and Grants Medical College & Sir J.J. Group of Hospitals, Mumbai, Maharashtra.

In the second phase of PMSSY, the Government has approved the setting up of two more AIIMS-like institutions, one each in the States of West Bengal and Uttar Pradesh and upgradation of six medical college institutions namely Government Medical College, Amritsar, Punjab; Government Medical College, Tanda, Himachal Pradesh; Government Medical College, Madurai, Tamil Nadu; Government Medical College, Nagpur, Maharashtra, Jawaharlal Nehru Medical College of Aligarh Muslim University, Aligarh and Pt. B.D. Sharma Postgraduate Institute of Medical Sciences, Rohtak. The estimated cost for each AIIMS-like institution is Rs. 823 crore. For upgradation of medical college institutions, Central Government will contribute Rs. 125 crore each.

In the third phase of PMSSY, it is proposed to upgrade the following existing medical college institutions namely Government Medical College, Jhansi, Uttar Pradesh; Government Medical College, Rewa, Madhya Pradesh; Government Medical College, Gorakhpur, Uttar Pradesh; Government Medical College, Dharbanga, Bihar; Government Medical College, Kozhikode, Kerala; Vijaynagar Institute of Medical Sciences, Bellary, Karnataka and Government Medical College, Muzaffarpur, Bihar.

The project cost for upgradation of each medical college institution has been estimated at Rs. 150 crores per institution, out of which Central Government will contribute Rs. 125 crores and the remaining Rs. 25 crore will be borne by the respective State Governments.

It is hoped that consequent to the successful implementation of PMSSY, better and affordable healthcare facilities will be easily accessible to one and all in the country.

References

Agarwal SP. National health policy 2002: New Perspectives. National Medical Journal of India 2002; 15(4): 213-214.

Amartya Sen. India's educational backwardness and lessons of Kerala. In. Jeem Drez & Amartya Sen (ed) Indian Development-Selected regional perspectives. Oxford University Press 1999: 14-19.

Chakravarthy K, Ravi Kumar CH, Deepthi K.Swot Analysis On: Medical Tourism. Conference on Tourism in India – Challenges Ahead, 15-17 May 2008, IIMK

Gandhi JC. Public Health in India: Future Challenges. Indian J Pub Health 2002; XXXXVI (4): 135-144.

Gangolli LV, Duggal R, Shukla A. Review of Healthcare in India. Mumbai: Cehat 2005.

Govt. of India. National Health Policy 2002. Ministry of Health & Family Welfare, Government of India (GOI), New Delhi.

Govt. of India. Annual Report 2005-06. Ministry of Health & Family Welfare, Government of India (GOI), New Delhi 2006.

Gupta AS. National Health Policy 2002: A Brief Critique. National Medical Journal of India 2002; 15 (4): 215-216.

Harr DS, Balch DC, McConnel ME. Next generation telemedicine: the future is now. North Carolina Medical Journal 1997; 58: 398-401.

http://www.and.nic.in/telemedicine.htm

http://www.and.nic.in/telemedicine.htm

http://www.whoindia.org/EIP/GATS/13-Annex2.pdf

http://medind.nic.in/maa/t05/i1/maat05i1p51.pdf

http://www.telemedicineindia.com/news.html accessed on 23rd Sept. 2005.

http://www.nhp.gov.in/pradhan-mantri-swasthya-suraksha-yojana-pmssy_pg

http://www.telepathology.org.in/about.html.

http:/ww.isro.org/rep2005/SpaceApplications.htm accessed on 23rd Sept 2005.

Institute of Medicine. Telemedicine: A guide to assessing telecommunication in health care. Washing DC: National Academic Press 1999.

Kishore J. Rationality of Investment in School Health. Rationalist Voice 2002; 1 (6): 12-14.

Kishore J. A Dictionary of Public Health. New Delhi: Century Publications 2007.

Kishore J. Investing in Primary Education: Key to the change in society. Ambedkar Medical Bulletin 1999; 1 (22): 271-274.

International Institute of Population Sciences. National family Health Survey 1998-1999, IIPS, Mumbai 2000.

Lal S. Implementation of National Health Policy-2002 (editorial). Indian Journal of Community Medicine 2002; 27 (2): 51-57.

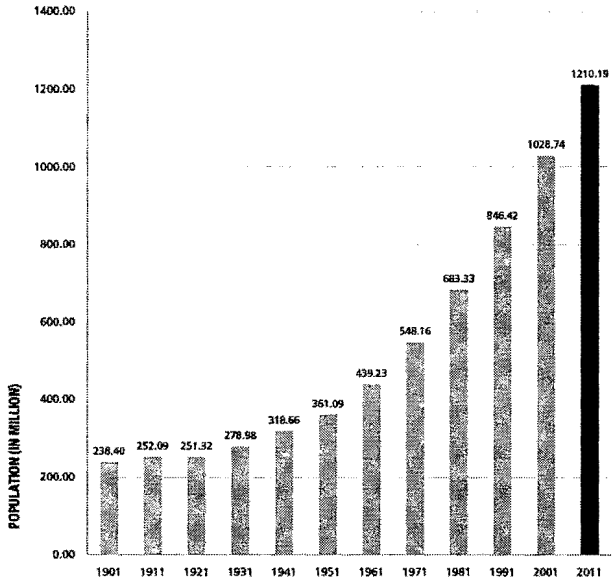
Nair VM. Draft National Health Policy 2001: A leap forward in assessment but limping in strategies. National Medical Journal of India 2002; 15(4): 216-220.

CHAPTER 44

NATIONAL POPULATION POLICY 2000

On 11 May, 2000 India is projected to have 1 billion (100 Crore) people and 16% of world's population on 2.4% of the globe's land area. If current trends continue, India may overtake China in 2045 and will become the most populous country in the world. While global population has increased threefold during this century, from 2 billion to 6 billion, the population of India has increased nearly fivefold from 238 million (23 crores) to 1 billion (100 crores) in the same period. In 2011 census it is once again proved that population control is one of the biggest challenge (Figure 44.1).

Figure 44.1: Population in millions since 1901-2011



Bare facts

- Every sixth person on the globe today is an Indian and by the turn of this century, every fifth living person will be an Indian.
- India adds about 10 lakh persons to its population every fortnight.
- India adds one Australia every eight months.
- By 2045 or earlier, India would overtake China as the world's most populous nation.
- 49 percent of the increase in India's population is from four states – Bihar, Madhya Pradesh, Rajasthan and UP, (BIMARU states, this word is dropped and replaced with Empowered States).

Causes of Population Explosion

1. Widening gap between birth rate and death rate
2. Low age at marriage.
3. High illiteracy mainly of women.
4. Unfavorable Religious attitude towards family planning.
5. Gender difference: women is in disadvantaged group suffered more from disease and death. Gender inequality are linked with higher fertility, poor nutrition, STDs, and unwanted pregnancies.
6. Socioeconomic status of the family particularly status of the women in decision power.
7. Importance of male child.
8. Joint family system: less responsibility of couple to bring up their children.
9. Lack of information: however awareness has

Table 44.1 : Most populous countries in the world

#	Country	2015 Population	2010 Population	2000 Population	2050 Expected Pop.
1	China	1,361,512,535	1,330,141,295	1,268,853,362	1,303,723,332
2	India	1,251,695,584	1,173,108,018	1,004,124,224	1,656,553,632
3	United States	321,368,864	310,232,863	282,338,631	439,010,253
4	Indonesia	255,993,674	242,968,342	213,829,469	313,020,847
5	Brazil	204,259,812	201,103,330	176,319,621	260,692,493
6	Pakistan	199,085,847	184,404,791	146,404,914	276,428,758
7	Nigeria	181,562,056	152,217,341	123,178,818	264,262,405
8	Bangladesh	168,957,745	156,118,464	130,406,594	233,587,279
9	Russia	146,267,288	139,390,205	146,709,971	109,187,353
10	Japan	126,919,659	126,804,433	126,729,223	93,673,826
TOP TEN Countries		4,217,623,064	4,016,489,082	3,618,894,827	4,950,140,178
Rest of the World		3,042,279,179	2,829,120,878	2,466,012,769	4,306,202,522
TOTAL World Population		7,259,902,243	6,845,609,960	6,084,907,596	9,256,342,700

increased tremendously but from where and how the family planning services available is lacking.

10. Lack of choice of contraceptives: Very few contraceptives are available to choose.
11. Side effects of contraceptives leading to distrust of people/users in contraceptives devices.
12. Poor services of family planning
13. Poverty: poor parents need more children to earn bread and butter that lead to Child labor
14. Workforce: for family business more children are preferred.
15. Strict laws, forceful implementation of family planning services: India has witness the effect of such policy in 1977 when forceful male sterilization led to political and public movement. Similarly China is facing resistance from the public due to her strict one child norm. China's family planning policies are never appreciated at local especially farmers in rural China and global level. Under the regulation, most urban couples are limited to one child, while in many rural areas, couples are allowed two, especially if the first child is a girl. Fines are commonly used to enforce the limits and violence and forced abortions occasionally applied. This policy is recognized as one of the reasons for imbalanced sex ratio in China.

Effects of Population Explosion

Population Explosion is the phenomenon of the size of a population tending to a very large number in a finite interval of time is called population explosion, i.e. rapid increase in population for a long time may be termed as population explosion (Birth rate is much higher than the death rate for long time may lead to population explosion) Table 44.1.

There are evidences of following effects due to population explosion:

1. Living standard of people:
   a) Large numbers of people are *homeless.*
   b) Majority of rural people are *without safe drinking water.*
   c) Around 35% of people are *illiterate* and much more are women.
   d) High prevalence of *underweight.*
   e) High prevalence of *malnourished* children and women.
   f) Houses and living areas are *overcrowded.*
   g) *Breakdown* of transportation, electricity, telephone.
2. Rise in *crime and violence.*
3. High level of *unemployment.*
4. Thousands go hungry due to *poverty* and one third of the population are below poverty line.
5. Famine: *Lack of cooking fuel and food.*
6. *Lack of facilities* for health education and research leading to poor health.
7. Poor *sanitation* services.
8. *Environmental degradation* in terms of air water and soil pollution.
9. *Deforestation* and ecology modification and distribution of agriculture holdings.
10. *Dissolution of family*: more divorces, separation, suicides etc. due to unhappiness.

Reasons for the failure to control the population explosion are as follows:

- ⇨ Lack of Political Commitment
- ⇨ Lack of People Participation
- ⇨ Lack of Quality Health Services
- ⇨ Lack of Education
- ⇨ Lack of Overall Development
- ⇨ Lack of Appropriate Technology
- ⇨ Lack of Transparent Administration
- ⇨ Lack of Women Empowerment

NATIONAL POPULATION POLICY 2000

Milestones

1948 Bhore Committee Report

1952 Launching of Family Planning Program

1976 Statement of National Population Policy

1977 Policy Statement on Family Welfare Program

1979 Conversion on the elimination of all forms of discrimination against woman (CEDAW)

1983 The Indian Government framed a National Health Policy in 1983, has set the long-term demographic goal of achieving a Net Reproduction Rate (NRR) of one by the year 2000. National demographic Goals were spelt out as follows:

1. The average size of the family would be reduced to 2.3.
2. The birth rate per 1000 population would be reduced to 21.
3. The death rate per 1000 would be reduced to 9.
4. The infant mortality rate would be reduced to <60 per 1000 live births.
5. The effective couple protection rate would be raised to >60%.

1986 The policy was evolved and promoted the slogan *"movement of the people, by the people, for the people".*

1991 National Development Council appointed a Committee on Population

1993 Dr. MS Swaminathan Report was submitted on National Population Policy

1995 4th World Conference on women in Beijing

1997 Cabinet approved the draft National Population Policy but could not be placed in front of both the houses of Parliament

1999 Another draft National Population Policy was finalized and approved by the parliaments as "National Population Policy 2000"

2002 National Health Policy 2003.

2005 NRHM and major focus on RCH

In the new millennium, nations are judged by the well-being of their people; by levels of health, nutrition and education; by the civil and political liberties enjoyed by their citizens; by the protection guaranteed to children and by safety provisions made for the vulnerable and the disadvantaged people. With this vision, the National Population Policy was framed.

OBJECTIVES

Immediate

- To meet the unmet need of contraception
- Strengthening health infrastructure
- Strengthening of health personnel
- Promote integrated services delivery for basic RCH care.

Mid Term

- To bring the total fertility rate (TFR) to replacement level i.e., 2 by 2010

Long Term

- Stable population by 2045.

National Socio-demographic goals for 2010

1. Address the unmet needs for basic RCH services, supplies and infrastructure.
2. Make school education up to age 14 years free and compulsory, and reduce drop outs at primary and secondary school levels to below 20 percent for both boys and girls.
3. Reduce IMR 30/1000 live births.
4. Reduce maternal mortality rate (MMR) less than 1 per 1000 live births.
5. Achieve universal immunization of children against all Vaccine Preventable Disease (VPD).
6. Marriage age should not be less than 18 but preferable 20 years.
7. Achieve 80% institutional delivery and 100% by trained personal.
8. Achieve universal access to information/

counseling services for fertility regulation and contraceptive with a wide basket of choices.

9. Achieve 100% registration of births, deaths, marriage, & pregnancy.
10. Containment of AIDS, and greater integration between the management of AIDS and STD.
11. Prevention & control of communicable diseases.
12. Integration of Indian system of medicine in provision of RCH services, and in reaching out to households.
13. Promote small family norm to achieve replacement level of Total Fertility Rate 2.1.
14. Bring about convergence in implementation of related social sector Programs so that family welfare become people centered Program

Strategies

Strategic themes must be simultaneously pursued in "stand alone" or intersectoral programs in order to achieve the national socio-demographic goals for 2010. Following strategic themes are presented in the policy:

1. **Decentralized planning and Program implementation:** The 73rd and 74th Constitutional Amendments Act, 1992, made health, family welfare and education a responsibility of village *Panchayat Raj Institutions (PRI)*. They need strengthening by further delegation of administrative and financial powers, including powers of resources mobilization. Since 33% of elected panchayat seats are reserved for women, representative committees of the panchayats (headed by an elected women panchayat member) should be formed to promote a gender sensitive, multi-sectoral agenda for population stabilization, that will "think, plan and act locally, and support nationally".

2. **Convergence of service delivery at village levels:** We need to promote a more flexible approach, by extending basic reproductive and child health care through mobile clinics and counseling services. Further, recognizing that government alone can't make for the inadequacies in health care infrastructure and services, in order to resolve unmet needs and extend coverage, the involvement of the voluntary sector and the non-government sector in partnership with the government is essential.

   Since the management, funding, and implementation of health and education Programs has been decentralized to panchayats, in order to reach household levels, a one-stop, integrated and coordinated service delivery should be provided at village levels, for basic reproductive and child health services. At least two trained birth attendants per village is required. It is proposed that an equipped **maternity hut** in each village should be set up to serve as a delivery room, with functioning midwifery kits, basic medication for essential obstetric aid, and indigenous medicines and supplies for maternal and new born care.

3. **EMPOWERING WOMEN for Improved health and nutrition:** Maternal mortality is an indicator of disparity and inequity in access to appropriate health care and nutrition services throughout a lifetime, and particularly during pregnancy and childbirth, and is a crucial factor contributing to high maternal mortality.

   Programs for Safe Motherhood, universal immunization, child survival and oral rehydration have been combined into an Integrated Reproductive and Child Health Program, which also includes promoting management of STIs and RTIs. Women's health and nutrition problems can be largely prevented or mitigated through low cost interventions designed for low income settings.

   The voluntary non-governmental sector and the private corporate sector should actively collaborate with the community and government through specific commitments in the areas of basic reproductive and child health care, basic education.

4. **Child Health and Survival**: Infant mortality is a sensitive indicator of human development. The priority is to intensified neonatal care. A National Technical Committee should be set up, consisting principally of consultants in obstetrics, pediatrics, family health, medical research and statistics from among academia, public health professionals, clinical practitioners and government. Its main aim is to set up perinatal audit norms, developing quality improvement activities with monitoring schedules and suggestions for facilitating provision of

continuing medical and nursing education to all perinatal health care providers.

The Baby Friendly Hospital Initiative (BFHI) should be extended to all hospitals and clinics, up to subcenters levels.

Child survival interventions i.e. universal immunization, control of childhood diarrhoeas with oral rehydration therapies, management of acute respiratory infections, and massive doses of Vitamin A and food supplements have all helped to reduce infant and child mortality and morbidity. With intensified efforts, eradication of polio may be possible very soon.

5. **Meeting the unmet needs for Family Welfare Services:** It is important to strengthen, energize and ***make accountable*** the cutting edge of health infrastructure at the village, subcenter and primary health center levels, to improve facilities for referral transportation, to encourage and strengthen local initiatives for ***ambulance services*** at village and block levels, to increase innovative ***social marketing*** schemes.

6. **Greater emphasis for Underserved population group:**
Urban Slums: Basic and primary health care, including RCH care, needs to be provided. Coordination with municipal bodies for water, sanitation and waste disposal must be pursued, and targeted information, education and communication campaigns must spread awareness about the secondary and tertiary facilities availability.
Tribal communities, Hill Area Populations and Displaced and Migrant Populations: need special attention in terms of basic health, and RCH services. Provision for ***mobile clinics*** should be made to cover these areas. Information and counseling on infertility, and regular supply of standardized medication will be included.

Adolescents: Programs should encourage delayed marriage and child bearing, and education of adolescents about the risks of unprotected sex. Reproductive health services for adolescent girls and boys is especially significant in rural India, where adolescent marriage and pregnancy are widely prevalent. Their special requirements comprise information, counseling, Population education, and making contraceptive services accessible and affordable, providing food supplements and nutritional services through the ICDS, and enforcing the Child Marriage Restraint Act, 1976.

Increased participation of men in planned parenthood: The active involvement of men is called for in planning families, supporting contraceptive use, helping pregnant women stay healthy, arranging skilled care during delivery, avoiding delays in seeking care, helping after the baby is born and finally, becoming a responsible father. Currently, over 97% of sterilization are tubectomies and this manifestation of gender imbalance needs to be corrected. The special needs for men include re-popularizing vasectomies, in particular ***no-scalpel vasectomy*** as a safe and simple procedure, and focusing on men in the information and education campaigns to promote the small family norm.

7. **Diverse health care provider**: In India there are many types of indigenous system of medicine serving people for thousands of years and most of them are now getting formal education in recognized institutions. These private practitioners need to be accredited and assigned with defined beneficiary groups to provide these services. There is a need to revive system of licensed medical practitioners who, after appropriate certification from the Indian Medical Association, could provide specific clinical services.

8. **Collaboration with and commitments from private agencies and NGOs:** Private health care has grown significantly, with an impressive pool of expertise and management skills, and currently accounts for nearly 75% of health care expenditures. However, despite their obvious potential, mobilizing the private (profit and nonprofit) sector to serve public health goals raises governance issues of contracting, accreditation, regulation, referral, besides the appropriate division of labor between the public and private health providers, all of which need to be addressed carefully.

9. **Involvement of Indian system of medicine in delivery of RCH services:** Utilization of Indian System of Medicine and Homeopathy (ISMH) in basic RCH care will expand the pool of effective health care providers, optimize utilization of locally based remedies and cures, and promote low cost health care. Guidelines need to be evolved to regulate and ensure standardization, efficacy and safety of ISMH drugs for wider entry into national markets.

10. **Contraceptive technology and research in RCH:** Consultation and frequent dialogue by government with the existing network of academic and research institutions in allopathy and ISMH, and with other relevant public and private research institutions engaged in social science, demography and behavioral research must continue. The International Institute of Population Sciences, and the population research centers which have been set up to pursue applied research in population related matters, need to be revitalized and strengthened.

    The Department of Family Welfare is strengthening its Management Information System (MIS) and has commenced during 1998, a system of ascertaining impacts and outcomes through district surveys and facility survey. The district survey cover 50% districts every year, so that every 2 years there is an update on every district in the country.

11. **Providing health care and support for the older population:** Promoting old age health care and support will, over time, also serve to reduce the incentive to have large families.

12. **Information, Education, and Communication:** There is a need to undertake a massive national campaign on population related issues, via artists, popular film stars, doctors, *vaidyas, hakims*, nurses, local midwives, women's organizations, and youth organizations.

Legislation

The 42nd Constitutional amendment allows Lok Sabha and Rajya Sabha seats to be frozen on the basis of 1971 census till 2026. This is important disincentive for poor performing state. Otherwise highly populated states like UP and Madhya Pradesh would continue to hold key on political power and put claim for more seats in both houses of parliament. 79th Amendment Bill of 1992 disqualify a person for being a member of either house of legislature of a state, if he/she has more than 2 children. This bill is still pending due to opposition by the legislators.

Public Support

Strong support of political, community, business, professional, religious leaders, media, film stars, sports personalities, and opinion makers has been sought for small family norms.

New Structure

For comprehensive and multisectoral coordination of planning and implementation between health and family welfare on the one hand, along with schemes for education, nutrition, and women and child development, safe drinking water, sanitation, rural roads, communications, transportation, housing, forestry development, environmental protection, and urban development the following structure has been proposed:

National Level: National Population Policy suggested a **National Commission on Population**, which should be chaired by Prime Minister and all Chief Ministers and senior officials of various ministries, departments, NGOs, health professionals and concern personnel should be the members and Commission secretary should be from the Department of Family Welfare.

State level: Similar State Commission on Population should be constituted.

Planning commission will be involved for intersectoral coordination by establishing the **Coordination Cell.** Technology mission should be constituted in the FW Department to provide technology support in respect of design and monitoring of projects and Programs for reproductive and child health, as well as for IEC campaign.

Funding

National Population Policy expressed that the Program, projects and schemes promised on the goals and objectives of the policy 2000 will be adequately funded.

Promotional and motivational measures for adoption of the small family norm

The following promotional and motivational measures will be undertaken:

1. *Panchayats* and *Zila* Parishads will be rewarded and honored for exemplary performance.
2. *Balika Samridhi Yojana* (Department of Women & Child Development) provide cash incentive of Rs.500 at the birth of the girl child of birth order 1 or 2.
3. Maternity Benefit Scheme (Department of Rural Development) provide cash incentive to mothers who have their first child after 19 years of age, for birth of the 1 and 2 child only.
4. A Family Welfare-linked health insurance plan will be established.
5. Couples below the poverty line will be rewarded for their active involvement in Family Planning activities.
6. Village-level ***self help groups*** will be set up.
7. Creches and child care centers will be opened in rural and urban slums.
8. A wider and affordable choice of contraceptives will be made accessible.
9. Facilities for safe abortion will be strengthened.
10. Innovative social marketing schemes will be promoted.
11. Ambulance services at the villages level will be strengthened.
12. Increased vocational training schemes for girls, leading to self-employment will be encouraged.
13. Strict enforcement of the Child Marriage Restraint Act, 1976.
14. Strict enforcement of the Pre-Natal Diagnostic Act, 1994.
15. Soft loans to ensure mobility of the ANMs will be increased.

A detailed action plan has been given in the policy document stressing on various areas of family planning activities.

Implementation

1. Empowered Action group has been constituted under the chairmanship of Union Minister of H&F Welfare. This is providing supportive leadership to the district administration in the implementation of centrally sponsored schemes and distribution plans.
2. National Commission of Population has been constituted similarly the State Commission have been constituted in many states.
3. State Population Policies has been formulated in many states with their specific goals, strategies, and Programs.

Janasankhya Sthiratha Kosh

National Population Stabilization Fund (NPSF) was set up under National Commission on Population. Subsequently, the NPSF was transferred to the Department of Family Welfare in April 2002. It was renamed and registered as Janasankhya Sthirata Kosh (JSK) under the Societies Registration Act, 1860 in June 2003. Objective of this ***Kosh*** is to attainment of the goals of National Population Policy 2000. The Fund will support projects, schemes, initiatives and innovative ideas designed to help population stabilization both in the Government and Voluntary sectors, and provide a window for channelizing resources through voluntary contributions from individuals, industry, trade organization and other legal entities in furtherance of the national cause of population stabilization. A contribution of Rs. 100 crores has been made out of the plan Budget of Department of Family Welfare. JSK has been reconstituted in June 2005. Under the new set up, the General Body of the JSK is chaired by the Minister for Health and Family Welfare, while the Governing Board chaired by the Secretary (H&FW).

JSK has following major activities:

1. GIS mapping: of 485 districts and its sub-divisions in the country has been done which identify the basic health infrastructure available and accessible and also density of the population.

2. Call center is established in 2008 with the aim to provide reliable and authentic information on issues related to reproduction and child health. It is toll free number of 1800-11-6555 which has recieved more than 50000 calls in a year.

3. Prerna strategy: It awards couples who fulfil criteria: girl marrying at the age of 19 years, having first child tow years after marriage, keeping a gap of 3 years between first and second child followed by sterilization of either parent.

4. Santushti: It is an incentive and PPP for private sector gynecologist and surgeon who get accredited

facilities with a advance of 100 sterilization surgeries and an additional Rs 500 per case to accredited nursing homes for conducting sterilization cases in camp mode in a single day.

*5. **IUCD 380A:*** In collaboration with FOGSI and department of community medicine many training workshops are held for senior practitioners to accept this IUCD.

*6. **Celebrating World Population Day*** with the objective to share experiences and promoting partnership for population stabilization.

COMMENTS

Planning: The NPP-2000 is highly relevant and desirable for a long time. However, the NPP-2000 was drafted and discussed almost entirely within a closed circle of the government during the past year. Apparently this lack of openness was due to disagreements within the ruling government about disincentives and legislation.

The Document of NPP 2000 has totally ignored the Swaminathan Committee's philosophy which emphasized the need for linking population to the ecosystem, gender issues, decentralized democracy and basic needs.

Causes of population explosion: Increase family size leading to large population is associated with poverty, high mortality and unemployment. The document specify the goal of increasing level of education but is not able to spell out the universalization of education. The most important aspect of population control is raising standard of living. Nothing is said about this that how it can be improved or there is a need for it.

Implementation: Setting up of a National Commission on Population reflected the deep commitment of the government but how effectively it gets translated into concrete action at the ground level is to be seen. There is all round realization that population stabilization is a must for ensuring quality of life for all citizens and the population stabilization is no longer to be achieved by setting targets for sterilization (Gupta & Sen 2000).

Instead of creating the Coordination Cell in the Planning Commission, it should have been in the Cabinet itself with a clear and time bound mandate to evolve workable procedures and operational guidelines.

Affected States: Emphasis on most effected states-Bihar/Jharkhand, Madhya Pradesh, Rajasthan, and Uttar Pradesh should be much more than given in the document. Administrative machinery in these states is already affected by many factors that need to be corrected before handing over power directly to the people when we say decentralizing decision and expenditure.

Involvement of NGOs: Uncontrolled/flexible functioning of NGOs and private agencies that do not follow any work guidelines of the government may not be suitable to the most vulnerable and disadvantage groups and poor employee and funding of such agencies need to be monitored appropriately.

Monitoring and Evaluation: The policy is silent on specifying procedure for monitoring and evaluation. Surveillance system for maternal health need to be effective. Many of the strategies suggested by policy have not been monitored such as constructions of Maternity Hut in every village, licensing and promoting barefoot doctors in rural areas, providing newer contraceptives, compulsory education up to 14 years of age, etc. The progress of policy must be published.

Medical Council of India-Dilution of standards: Suggestion to revive system of licensed medical practitioners and privatizing facilities need to be reviewed carefully because there is a wide spread malpractice that is mainly done by unregistered quacks and there is a strong opposition from Indian Medical Association to give license to the unregistered practitioners.

Unrealistic targets: Increasing institutional deliveries is not feasible unless their qualities and access can be dramatically improved.

Rewarding the couple of below poverty line may not be ethical because they accept sterilization in compulsion for incentives. It should become the policy of masses so that there should not be any need of incentives and disincentives.

Neglected issues: Growing interstate demographic and economic disparity, sterilization failure, low vasectomies, prebirth sex determination tests leading

to female feticide and increasing neglect of population research in the wider social context, high rural IMR and MMR, adverse sex ratio, etc. are the burning issues which need urgent attention. Population stabilization should be a national movement. Not much is highlighted on women and child health. Similarly child nutrition is totally neglected.

There should have a balanced focus on health workers (female) and anganwadi workers. Anganwadi workers are least paid and most neglected work force in the country that need to be strengthened further in terms of payment, work conditions, and better involvement in health delivery.
Grass root workers and community leaders should understand the problem of population and should actively participate in control strategy.

Women's right: In the west, the movements for birth control and the availability of contraceptives were located within the larger women's rights movement; in India, however, birth control is advocated in the name of population control. Due to low status of women, powerlessness and poor quality of child delivery system, maternal mortality rates remain high at 408 per 100,000 live births, and range between 29 per 100,000 live births in Gujarat to 677 in Rajasthan.

Population issue: The vast number of the people of India can be its greatest asset if they are provided with the means to lead healthy and economically productive life. There are countries with significantly higher population density than India but have much higher annual per capita incomes too (Table 44.1).

Table 44.1: Countries with their population density and annual per capita incomes

Country	Population/ sq.m	Per Capita Incomes in $
Singapore	6751	24389
South Korea	491	19497
Belgium	338	29108
Japan	335	28700
India	319	2537
North Korea	184	990
Myanmar	62	1733
Kenya	52.4	1089
Sudan	15	1387

SWOT ANALYSIS

Strength

- Formulation of National Policy by the Health Ministry involving Planning Commission and Cabinet
- Policy is passed by the parliament.
- Well planned and drafted after many deliberations particularly Swaminathan Committee and National Health Policy 1983.
- Long experience of National Family Welfare Program.

Weakness

- Some of the goals and targets are unrealistic.
- Many failures in achieving targets in the past.
- Lack of community involvement.
- Lack of resources and poor budgeting.
- Lack of well planned monitoring and evaluation.

Opportunity

- Provision of Research in RCH and Contraceptive that will handle the increasing demand.
- Integrated approach involving mother, adolescent, and child in the area of nutrition, health, education, involving other system of medicine, etc.
- Decentralization and more autonomy for better implementation.
- Provision of legislation act as disincentive for large family size for legislature and councilors. Strict enforcement of Child Marriage Restraint Act and Pre-Natal Diagnostic Act is also provided.
- Adequacy of funding ensured.

Threat

- Reviving system of licensed medical practitioners may not be supported by Indian Medical Association and other professional bodies.
- Flexibility in NGOs functioning may give rise to more corruption and compromise in the achievement of targets.
- Cash incentive and heavy dependency on health care providers in government system would compromise the quality and increase financial burden.
- More encouragement to private sector will make the India the most privatized health system in the world.

COUNTRY PROGRAM – 6 OF UNFPA

This program has been launched from January 2003 to December 2007, which will cover 32 Districts of 6 states of Rajasthan, Maharashtra, Kerala, Orissa, MP, Gujarat. It aims to:

- Reach out to families and individual men and women to avail quality family planning and whole package of reproductive services;
- Assist government to strengthening infrastructure and health services;
- Bring in human rights and gender perspective to family planning, reproductive health and gender issues;
- Work with state governments at the policy and advocacy level.

Total outlay earmarked for the project in 6 states is Rs. 365.00 Crores for a period of 5 years.

References

Govt. of India. National Population Policy 2000. Department of Family Welfare, Ministry of health & Family Welfare, GOI, New Delhi.

Gupta VM, Sen P. National Population Policy 2000: An Insight (Editorial). Indian Journal of Public Health 2000; 44 (1): 1-4.

Govt. of India. Annual Report 2004-2005. Ministry of H&FW, GOI, New Delhi.

CHAPTER 45

NATIONAL AIDS PREVENTION AND CONTROL POLICY

INTRODUCTION

Epidemic of Human Immunodeficiency Virus/ Acquired Immunodeficiency Syndrome (HIV/AIDS) in India has emerged as one of the most serious public health problems in the country. The initial cases were reported among commercial sex workers in Mumbai and Chennai and injecting drug users in the northeastern State of Manipur. The infection has since then spread rapidly in almost every district of the country. However, the overall prevalence in the country is still, very low, a rate much lower (0.75%) than many other countries in the Asia region like Cambodia (2.77%), Myanmar (1.99%), Thailand (1.85%).

In the recent years it has spread from urban to rural areas and from individuals practicing risk behavior to the general population. Studies indicate that more and more women attending antenatal clinics are testing HIV-positive thereby increasing the risk of perinatal transmission. About 85 per cent of the infections occur from the sexual route (both heterosexual and homosexual), about 4 percent through blood transfusion and another 8% through injecting drug use. About 89% of the reported cases are occurring in sexually active and economically productive age group of 15-49 years. One in every 4 cases of AIDS reported is the woman. Such rapid spread of the epidemic across the country today is due to labor migration and mobility in search of employment from economically backward to more advanced regions, low literacy levels leading to low awareness among the potential high risk groups, gender disparity, sexually transmitted infections and reproductive tract infections both among men and women beside the social stigma attached to it. Although transmission of HIV through use of needles, razors and other cutting instruments in beauty parlors, haircutting saloons and dental clinics is insignificant, lack of hygienic practices in majority of these establishments also poses a health risk to the unsuspecting general population who visit these places every day.

Discrimination against People Living With HIV/AIDS (PLWA) denies them access to treatment, services and support and hinders effective responses. There have been cases of refusal of treatment and other services to AIDS patients in hospitals and nursing homes both in Government and private sectors. This has compounded the misery of the AIDS patients. In the workplace there are cases of discrimination leading, on some occasions, to loss of employment.

The treatment options are still in the initial trial stage and are prohibitively expensive. There are fears of patients developing drug resistance and side effects if the therapy is not administered under proper medical supervision. There are instances of quacks taking advantage of the situation and promising cures and defrauding unsuspecting people who are infected with the virus of large sums of money. There is no vaccine.

Economic Loss

The effects of the epidemic radiate from the household across society. In Cote d'lvoire, urban households that have lost at least one family member to AIDS have seen their income drop by 52-67%, while their expenditure soared four fold. To cope up, they have to cut their food consumption by about 41%. Rural households facing similar predicaments in Thailand are seeing their agricultural outputs shrinking by half. In 15% of the cases, children are removed from schools to take care of family members who are ill and to regain lost income.

Response

A high-powered ***National AIDS Committee*** was constituted in 1986 and a ***National AIDS Control Program*** was launched a year later. In the initial years the Program focused on generation of public awareness through mass communication Programs, introduction of blood screening for transfusion purposes and conducting surveillance activities in the epicenters of the epidemic. In 1992 the Government formulated a multisectoral strategy for the prevention and control of AIDS in India. It is implemented through the ***National AIDS Control Organization*** at the national level and State AIDS Cells at the State/UT levels. AIDS prevention and control strategy focuses on following areas:

1. Program Management;
2. Surveillance and Research;
3. Information, Education and Communication including social mobilization through Non-Governmental Organizations (NGOs);
4. Control of Sexually Transmitted Diseases;
5. Condom Programming;
6. Blood Safety; and
7. Reduction of Impact.

A paradigm shift in the response against HIV/AIDS at all levels making it imperative to formulate a comprehensive national policy on HIV/AIDS in order to cope effectively with the changed nature of the HIV/AIDS problem has been adopted.

Goal

Effective containment of the infection levels of HIV/AIDS in the general population in order to achieve zero-level of new infections by 2007.

Objectives

1. To reiterate strongly the Government's firm commitment to prevent the spread of HIV infection and reduce personal and social impact;
2. To generate a feeling of ownership among all the participants both in the Government and non-Government sectors at most peripheral to central levels;
3. To create an enabling socioeconomic environment for prevention of HIV/AIDS by (a) providing care and support to People Living With HIV/AIDS (PLWHA), (b) ensuring protection/promotion of their human rights including right to access health care system, right to education, employment and privacy to mobilize support of NGOs/ Community Based Organizations (CBOs) for an enlarged community initiative (c) overcoming stigmatization, discrimination and seclusion in society associated with HIV/AIDS;
4. To decentralize and strengthen Program management capabilities at various levels like center, the State Governments, municipal corporations, panchayat institutions and leading NGOs participating in the Program;
5. To integrate horizontally with other national Programs like Reproductive and Child Health, TB Control, Integrated Child Development Scheme and with the primary health care system;
6. To prevent women, children and other socially weak groups from becoming vulnerable to HIV infection by improving health education, legal status and economic prospects;
7. To collaborate and coordinate with international and bilateral agencies for support and cooperation in the field of research in vaccines, drugs, emerging systems of health care and other financial and managerial inputs;
8. To ensure availability of adequate and safe blood and blood products for the general population through promotion of voluntary blood donation in the country; and
9. To promote better understanding of HIV infection among people, especially students, youth and other sexually active sections through awareness and behavior modification Programs.

In policy initiative it is stated that level of awareness shall be raised to more than 90% in next 5 years which should have been one of the objectives.

Strategy

1. **Prevention of further spread of the disease by**
   (a) making the people aware of its implications and provide them with the necessary tools for protecting themselves;
   (b) controlling STDs among vulnerable sections together with promotion of condom use as a preventive measure;
   (c) ensuring availability of safe blood and blood products; and
   (iv) reinforcing the traditional Indian moral values among youth and other impressionable groups of population.

2. **To create an enabling socioeconomic environment** so that all sections of population can protect themselves from the infection and families and communities can provide care and support to people living with HIV/AIDS.

3. **Improving services for the care** of PLWHA in times of sickness both in hospitals and at homes through community healthcare.

Policy Initiatives

Severity of disease is anticipated in terms of mortality and economic loss and no nation should wait for that situation to come in near future. An urgent policy decision is required at the national level to combat the epidemic which has consequences not only in health sectors but also in all other sectors like, industry, agriculture, rural development, tourism, transport, etc. For this purpose the policy recognizes the following issues as critical for bringing in a paradigm shift in the response to HIV/AIDS at all levels both within and outside Government.

Program Management

As economically productive sections of the population are the most susceptible to the disease, participation of Ministries like Railways, Surface Transport, Heavy Industry, Steel, Coal, Youth affairs & Sports and other public sector undertakings employing large workforce require to be actively involved in the Program. Ministries like Social Justice & Empowerment, Women and Child Welfare, Human Resource Development, etc. should devise and own up the HIV/AIDS control Programs within their own sectoral jurisdiction. There should be strong budgetary and managerial support to these sectoral Programs from within these Ministries. For smooth flow of funds to the Program and functional autonomy, the municipal corporations, NGOs, State AIDS societies are directly involved.

The district level Societies plays a very active role in implementing the programs and receive funds directly from the national programs like TB, Leprosy, etc. The same infrastructure at the district level can be utilized for prevention and control of HIV/AIDS.

Advocacy and Social Mobilization

There is still inadequate understanding of the serious implications of the disease among the legislators, political and social and religious leaders, bureaucracy, media, leaders of trade and industry, and professional agencies and also among the medical and paramedical personnel. A strong advocacy campaign needs to make them understand and motivate about the need for immediate prevention of the disease and also for adopting a humane approach to the patient and total prohibition of discrimination.

In school, AIDS education through curricular and extracurricular approach and the 'Universities Talk AIDS' (UTA) Program should be made universal throughout the country in order to mobilize large sections of the student community. Nonstudent youth should be imparted education through the network of youth organizations, sports clubs, National Service Scheme (NSS) and Nehru Yuvak Kendras. Corporate sector should also be involved in activities of AIDS Program for their employees.

Appropriate Programs which lay stress on interpersonal communication for targeted groups like students, youth, women, migrant workers and children, and the electronic media should be utilized for dissemination of information on all aspects of HIV/AIDS including reinforcement of positive cultural and social values like love, warmth and affection within the family. The newspapers, magazines and other print media should be used for conducting campaigns for social mobilization in local languages and ethos. Media campaigns in rural areas should lay emphasis on local traditions and cultures and should be conducted through folk dances, *jatras*, puppet shows, street plays, etc. The Family Health Awareness Campaigns which lay stress on community mobilization for awareness

generation and utilization of primary health care services for control of STDs/ RTISs should be conducted at frequent intervals throughout the country.

Participation of NGOs/CBOs

The National AIDS Control Program has recognized the importance of NGOs participation and commits to the involvement and participation of NGOs/CBOs in the following manner:

1. Involvement of NGOs at the policy making level through regular interaction and adequate representation in national and State level bodies;
2. Provision of medical facilities including home-based care, opening of community care centers, etc. apart from the conventional areas of awareness, counseling and targeted interventions among risk groups;
3. Training and capacity building Programs for the NGOs to empower them to take up these additional responsibilities;
4. Periodical updating of guidelines to facilitate greater participation of NGOs and for better accountability; and
5. Encourage networking among NGOs to avoid duplication of efforts. The nodal NGOs will be coordinating the work of all the NGOs at the State level.

Control of Sexually Transmitted Diseases (STDs)

The risk of transmission is 8 to 10 times higher in case of persons with STDs compared with others. As the risk behavior of persons with STDs and HIV is the same, Government attaches top priority to the prevention and control of STDs as a strategy for controlling the spread of HIV/AIDS in the country. The following approach will be adopted by the Government for STDs control:

1. Management of STDs through syndromic approach in general health service.
2. To avoid social stigma associated with STDs, HIV and AIDS the services are integrated for treatment at all levels of health care. STDs Clinics at district/ block/First Referral Unit (FRU) level would function as referral centers and all STD Clinics at all levels manned by trained staff; and
3. Provision of counseling services and good quality condoms to the STDs patients.

Use of Condoms as a HIV/AIDS Prevention Measure

Government feels that there should be no moral, ethical or religious inhibition towards propagating the use of condoms amongst sexually active people specially those who practise high-risk behavior. Condoms use would be promoted by the social marketing and community-based distribution system. High quality and reliability condoms should be easily available at all possible places. 'Condom' has been included in Schedule 'R' of the Drugs and Cosmetics Act for ensuring adequate quality control in their manufacture and distribution.

HIV Testing

HIV testing carried out on a voluntary basis with appropriate pretest and post-test counseling is considered to be a better strategy. Government of India has issued a comprehensive HIV testing policy which includes:

1. No individual should be made to undergo a mandatory testing for HIV;
2. No mandatory HIV testing should be imposed as a precondition for employment or for providing health care facilities during employment. However, in the case of Armed Forces, before employment, HIV screening may be carried out voluntarily with pretest and post-test counselling and the results may be kept confidential;
3. Adequate voluntary testing facilities with pretest and post-test counseling should be made available throughout the country in a phased manner. There should be at least one HIV testing center in each district with proper counseling facilities;
4. In case a person likes to get the HIV status verified through testing, all necessary facilities should be given to that person and results should be kept strictly confidential. Such results should be given out to the person and with his consent to the members of his family. Disclosure of the HIV status to the spouse or sexual partner of the person should invariably be done by the attending physician with proper counseling. However, the person should also be encouraged to share this information with the family for getting proper home-based care and emotional support from the family members; and
5. In case of marriage, if one of the partners insists on a test to check the HIV status of the other partner, such tests should be carried out by the

contracting party to the satisfaction of the person concerned.

The HIV testing is carried out in following situations:
a) Screening in blood banks
b) Epidemiological surveys; and
c) Confirmatory testing for clinical management and voluntary testing.

In the case of screening for blood donation, a single test of ERS (ELISA/Rapid/Simple) is conducted to eliminate HIV sero-reactive blood. In the case of epidemiological surveys, two tests either with ELISA, or Rapid or Simple will be done. In both these cases the testing is unlinked and anonymous. In the case of diagnosis of clinically suspected cases and for voluntary testing, the testing will be done with 3 ERS using HIV kits with different antigens. HIV testing under these conditions will be carried out with proper pretesting and post-testing counseling with informed consent of the individual and with proper follow up facilities.

For private sector hospitals, clinics, nursing homes and diagnostic centers, the State Governments should adopt legislative and other measures to conform to the national policy and guidelines relating to HIV testing.

Counseling

All hospitals, HIV testing centers, blood banks, STDs Clinics and organizations formed by PLWHAs should have individual and group counseling services manned by trained and professional counselors and government will provide all help to achieve this.

Care and support for People Living With HIV/AIDS (PLWHAs)

The Government would try to ensure the social and economic well being of patients, protection of their right to privacy and other human rights, proper care and support in the hospitals and in the community.

They should be guaranteed equal rights to education and employment, and confidentiality of their HIV status. HIV-positive women should have complete choice in making decisions regarding pregnancy and childbirth. The prophylaxis for prevention of mother to child transmission will be introduced to cover all infected mothers as a part of the national Program.
The Government would actively encourage and support formation of self-help groups among the HIV-infected persons for various Program activities.

An efficient referral system would be established starting from testing centers and counseling sites to hospitals or clinics, community-based services and home-based care. Enforcement of biosafety and infection control measures in the hospitals as per the universal safety precaution guidelines are also focused in the policy. Adequate facilities would also be created for proper disposal of plastic and other wastes and injecting needles used for treatment of HIV-infected persons.

There is a provision of financial support to the states/UTs for the treatment of opportunistic infection in all public sectors. But ante-retroviral therapies are not supported by the Govt. in the Program because of their prohibitive costs on account of indefinite period of treatment and other supportive investigations required for monitoring the progress of the disease. However, policy has emphasized that there will be a reduction in the excise and custom duties on Anti Retroviral Drugs to make them available to PLWAs at reasonable price.

Surveillance

The surveillance system would include:
(a) HIV Sentinel Surveillance,
(b) AIDS Case Surveillance,
(c) STDs Surveillance, and
(d) Behavioral Surveillance.

HIV and Injecting Drug Use

'Harm Minimization' approach is being accepted as an effective preventive mechanism which includes appropriate health education, improvement in treatment services, providing of bleaching powder, syringes and needles. An appropriate Needle Exchange Program with proper supervision by trained doctors/counselors, etc. will be required. Government will encourage NGOs working in the drug de-addiction Programs to take up harm minimization.

Safety of blood and blood products

A comprehensive National Blood Policy encompassing all the aspects of the operation of blood banks including voluntary blood donation Program and appropriate clinical use of blood and blood products has been prepared (Please see National Blood Policy).

Research and Development

Government recognizes the need to encourage and support research and development in the following areas:

1. Collaborative research with scientific groups in developed countries for development of vaccines suitable for the strains of HIV prevalent in India. Trials of vaccines will be subject to standard ethical guidelines developed and adopted by the Indian Council of Medical Research (Please also see National Medical Research Policy);
2. Pilot studies on efficacy of AZT and Nevarapine prophylaxis on HIV-positive pregnant women;
3. To indigenize the technology for manufacture of Anti-retroviral drugs so that cost can be reduced;
4. Creating epidemiological data base on HIV/AIDS and other related subjects; and
5. Encourage indigenization of the HIV-related equipment like test kits.

Indigenous Systems of Medicine (ISM)

The Government has sponsored research projects in Homeopathic and Siddha systems of medicines to develop drugs against HIV. At the same time it is necessary to be vigilant against unscrupulous persons claiming a cure for HIV/AIDS by magic remedies. The Drugs and Magic Remedies Act requires amendment to stringently deal with cases of unscrupulous persons.

Bilateral and International Cooperation

Government recognizes the vital role and contribution of UN agencies, World bank, and Bilateral agencies of USA, UK, etc., for their specific Program intervention and continue to seek their support and cooperation in future. Government will promote mutual information sharing with these countries and the neighboring countries in the South Asia region on their national AIDS control plans.

HIV/AIDS and Human Rights

Government will adopt the following measures to implement an effective rights based response.

1. Review and reform criminal laws and correctional system to ensure that they are consistent with international human rights obligations;
2. Strengthen antidiscrimination and other protective laws;
3. Ensure widespread availability of qualitative prevention measures and services in terms of medical, legal, financial services;
4. Promote wide distribution of creative, education, training and media Programs to change attitudes of community towards discrimination and stigmatization;
5. Collaboration with and through the community will promote a supportive and enabling environment for women, children and other vulnerable groups; and
6. Cooperate through all relevant Programs and agencies of the United Nations System, including UNAIDS, and bilateral agencies for all Program activities.

Implementation Strategy

1. The commitment of the political, administrative and community leaders and their sensitization particularly, the elected representatives of the three tier Panchayat system, the district administration and public health service providers, on the potential risks and consequences of a widespread HIV/AIDS epidemic in the country;
2. Securing the involvement and participation of all sectors both in the Government and outside particularly, social sector Ministries such as Human Resource Development, Youth affairs, Women & Child development, Rural Development and large employer Ministries such as Defence, Railways, Steel, Industry, Mines, etc. for Programs on HIV/AIDS prevention and control;
3. Empower the state Governments by decentralizing the entire delivery system to the State and district levels through autonomous State AIDS Control societies;
4. It is necessary to integrate this into the general health care system at the district level and below;
5. NGO, CBOs and Private health care providers are also sensitized to the issues related to prevention and control of HIV/AIDS and social mobilization;
6. Specific groups like students, out of school youth, sexual partners or migrant workers need specially packaged awareness Programs on the risk and vulnerability to HIV/AIDS;
7. To Promote formation of self help groups for PLWHAs and support drop-in centers where PLWHAs can get together and discuss their common problems;

8. To evolve a strong monitoring mechanism at every level to periodically monitor implementation of targeted intervention projects, care and support Programs, family health awareness campaigns, etc. which are implemented by the State AIDS Control Societies. Periodic external evaluation should be the part of Program.

COMMENTS

1. A clear understanding of sexual behavior is vital for the efficacy of the national response to the HIV/AIDS epidemic. Unfortunately, the understanding in the NAPCP seems to be through a normative/moral framework. This hinders the understanding of diversity in sexual behavior and values around sexuality. There are various groups like migrant populations, men who have sex with men and existence of commercial sex workers. There is a need to step outside this understanding and deal with the epidemic in an open manner by understanding sexuality outside this normative framework (LC HIV/AIDS Unit 2002).
2. HIV testing as a prerequisite for employment is not permissible in any other sector the policy makes an exception for armed forces, where before employment, HIV screening with pretest and post-test counseling should be carried out and the result may be kept confidential. This policy of permitting mandatory but informed testing is a contradiction in terms and discriminatory (LC HIV/AIDS Unit 2002).
3. Policy has enumerated all the issues of concern as policy initiatives which are already enumerated in the National AIDS Control Program. Policy has not clearly specified time-bound measurable targets that need to be achieved.

References

Govt. of India. National AIDS Prevention and Control Policy, NACO, Ministry of Health & Family Welfare, Govt. of India, New Delhi.

Lawyer Collective HIV/AIDS Unit. The national AIDS Prevention and Control Policy-A comment. Newsletter 13; June 2002.

CHAPTER 46

NATIONAL VACCINE POLICY

BACKGROUND

The Expanded Program for Immunization (EPI) in India was launched in 1978. The ambit of EPI was increased with the inclusion of measles vaccine (and discontinuation of typhoid vaccine) in 1985 and it was renamed as the Universal Immunization Program (UIP). The aim of UIP was to cover all districts in the country by 1990, in a phased manner and target all infants with the primary immunization and all pregnant women with TT immunization. For almost 2 decades, UIP did not add any additional vaccine. However, since 2006, vaccines namely Hepatitis B, second dose of measles and Japanese Encephalitis (JE) vaccine have been introduced. During the same period, a number of other safe and efficacious vaccines have become available for major killers like pneumonia and diarrhea, which are being used in the immunization programs of many developing and developed countries.

Purpose: A National Vaccine Policy with specific relevance to local vaccine needs is required to guide decision-making and develop a long-term plan to strengthen the whole vaccine program and not just a component. This National Vaccine Policy does not intend to cover all aspects of immunization service delivery or is not a detailed guideline on specific vaccine. This Policy document intends to provide broader policy guidelines and framework to guide the creation of evidence base to justify need for Research and Development (R&D), production, procurement, quality assessment of vaccines for UIP in India. It also addresses the broad issues of strengthening the institutional framework, processes, evidence base and framework required for decision making for new vaccine introduction, addresses vaccine-security & program management, regulatory issues, and product development.

Current UIP vaccines: UIP in India and its core antigens have made a significant impact on the burden of diseases and child mortality reduction in the country. However, the regular production and supply of these vaccines was always threaten by internal resource constraints and interest of private sector and need to be handled.

New and under-utilized vaccines: There are a number of new vaccines, which have become part of National Immunization Programs (NIPs) in many developing and developed countries. Many a times, the decision to introduce these vaccines is delayed due to limited production capacity, which indirectly affects the price of these vaccines too. Sometimes vaccines are not used as these are not indigenously produced or not available in sufficient quantity. On the other hands, the manufacturers don't produce vaccine because these are not used in the program. The authorities should use innovative financing, funding and assured supply mechanisms to overcome these challenges. Furthermore, there is need for the institutionalizing and strengthening of decision making process and enhancing confidence of the people in

the process besides preparing in-built country mechanism for sustainable production of newer vaccines within country.

India has a leading vaccine industry; however, there is need for investing more on the research for the vaccines for the priority diseases in the country. Such research can be promoted only when there is conducive environment, funding and subsequent chances of vaccine being introduced in the National program.

India should be able to ensure quality, safety, and efficacy of all vaccines that are either indigenously produced or imported for the use in the country. Achieving this requires a robust regulatory mechanism to be in place. Furthermore, the implementation of immunization program should be put in the perspective of broader goals of National Health Policy. The sufficient political will & support, and the necessary sufficient and sustainable financing mechanisms should also be ensured for this purpose.

Situation Analysis

Burden of VPDs and their surveillance

Since the beginning of EPI in India, there has been a general decline in the reported number of cases of the main VPDs (diphtheria, tetanus, pertussis and measles). The overarching goal of vaccine use is to reduce morbidity and mortality due to vaccine preventable diseases (VPD). While surveillance information for specific VPD is limited, trends in Infant Mortality Rate (IMR) to reflect the impact of vaccination suggest that IMR in India has fallen steadily to reach 50 deaths per 1000 livebirths (SRS 2009).

For almost 2 decades since the beginning of UIP, India had same 6 antigens in the UIP and recently Hepatitis B and measles second dose has been incorporated in UIP. There are a number of diseases, for which vaccines exists for long (Typhoid, Rubella), which may further be considered for the introduction in NIP in India. Similarly, a number of new vaccines have become available in last few years. Haemophilus influenzae type b (Hib) vaccines, Pneumococcal conjugate vaccines, Rotavirus vaccines, HPV vaccines, which have estimated high burden and possible role in reducing child mortality in India.

One of the major hurdle in the decision making process for the introduction of new vaccine has been the lack of indigenous surveillance data to assess the disease burden. The country need to build upon the available investigator initiated research, modeling data, and systematic reviews to assess the disease burden.

Nonetheless, the efforts should be made to strengthen VPD surveillance system. The institutional capacity building should be done for conducting demonstration projects and impact studies in the country.

Barriers to strengthen Immunization Program

There are well recognized challenges in the implementation of immunization program in the country. These challenges are:

- Weak VPD surveillance system;
- Lack of data on disease burden in India and resulting perception that the disease is not important public health problem;
- Lack of diagnostic tools for certain vaccine preventable diseases that could be used without sophisticated instruments or specialized training;
- Lack of baseline surveillance data also is a bottleneck in monitoring the impact of vaccination;
- Limited economic evaluations to show cost effectiveness of vaccines over other interventions to support decision-making;
- Lack of a financial sustainability plan for the introduction of new vaccines in the UIP also affects decision making in this area.
- Shortage of trained manpower to manage the UIP at the Center as well as State levels, for innovations in vaccines, for disease surveillance and for procurement and effective vaccine management.

This policy document also aims to provide policy measures to address the above mentioned barriers.

Vaccine Research Development

The research and development (R&D) and manufacturing of vaccines for locally prevalent diseases in India should be given a priority. These include vaccines for major killers like pneumonia and diarrhea, diseases with potential to cause outbreaks like JE, Dengue, Cholera, Typhoid and diseases like Leishmaniasis etc. The policy advocates that the processes, funding, networks, repositories etc. should

be made available. India has a number of institutions, where vaccine related projects are implemented i.e. Indian Council of Medical Research (ICMR), Department of Science and Technology (DST), Council for Scientific and Industrial Research (CSIR), small and medium vaccine industries, medical and engineering schools, in addition to the Department of Biotechnology (DBT) supported autonomous institutions.

A number of linkages need to be explored between academia, industry and international institutions such as NIH/NIAID, Gates Foundation, GAVI Alliance, PATH, WHO and the International Centre for Genetic Engineering and Biotechnology (ICGEB). Areas that require attention include the following:

- A fund for grand challenges in vaccine R&D needs to be created. The vaccine grand challenge mechanism will ensure that all varied type of infrastructures and services, approved by Central Drugs Standard Control Organization (CDSCO) are available, accessible, and affordable to the investigators involved in vaccine research and development.
- Flexible governance and granting systems should be in place to ensure that additional science funding, cooperate granting system (where funding agency, project managers and investigators work as a team for collective decision making) and subcontracting mechanisms are in place.
- Enabling processes for rapid decision-making to allow building alliances and partnerships, both national and global, and for support to agencies for diffusion of the technologies into the social systems, should be in place.
- Workable mechanisms need to be developed to sustain vaccine development teams, for a decade or more, for a continuity and focus, and new skills incorporated to fulfill evolving requirements.

Mapping of research capacity and network: The mapping of vaccine R&D activities in the country is important to assess the strengths and gaps, and to avoid duplication of efforts. The mapping exercise could result in disease or intervention (drug/ vaccine/ delivery systems/adjuvants) specific networks that could synergize the efforts and enable concentration of resources, both monetary and human, towards fight against a specific disease or a group of diseases (for example a network of neglected tropical diseases). These networks could then collaborate within themselves, share intellectual property, expertise, biological material and also collaborate with international groups working on similar projects. There is need of Creation of Sophisticated and Analytical Instrument Facilities (SAIF) within a region/state that will encourage sharing of expensive instruments and enable participation of investigators from various universities and institutions.

Creation of Bio-repositories: Banking of biological samples both sera and organisms that are collected during diseases surveillance, epidemics or clinical trials can be a tremendous source of materials for retrospective use in identifying biomarkers, genetic make-up or studying changes in pathogenic organisms in India in case of re-emergence of a disease. Administration, management, custodianship, and security of biobanks can be major issues. Without proper guidelines and policies about benefit-sharing, data-sharing, privacy, access (both for depositing of samples and retrieval), policies to handle bio-piracy etc., a well intended effort can't function optimally.

- The existing guidelines of the National Biorepository in India and the best practices should be examined and specific Standard Operating Procedure and Guidelines needs to be drafted,
- The bio-repositories need to be equipped with fingerprinting, sequencing for analysis of the genetic makeup of the organism, and freeze-drying facility for long-term storage,
- The repositories should be accredited and linked with International Repository System and to other discovery research units in the country,
- There is an urgent need to establish a repository for pathogenic organisms. All the data sets generated should be strongly linked with other national programs.

Public Private Partnerships

To strengthen PPP mechanisms in vaccine research: a) flexible governing and funding mechanisms should be evolved; and b) flexibility of contracting experts, both from national and global pool for a defined period should be built-in. A need based realistic procurement policy should be made. For example, the public private

partnership route have resulted in shortening of the time frame for vaccine development, such as the Meningococcal Meningitis Vaccine Initiative (MMVI), where the product was produced in India with multiple partners, met international standards in quality, was exported to and used in Africa. The model has been instrumental in indigenously 116 E rotavirus vaccine being developed with effective collaboration between Indian & US academia, and Indian vaccine industry in partnership with PATH.

Another example is the development of influenza H1N1 vaccine with support of 3 Indian vaccine manufacturers under the BIPP (Biotechnology Industry Partnership). An indigenous new generation Oral Cholera Vaccine has also been brought to the market under such model with the partners being International Vaccine Institute, Korea, National Institute of Cholera and other Enteric Diseases (NICED), Kolkata, and Shantha Biotechnics Ltd, Hyderabad.

In order to fund the long and multistage pathway of vaccine development, where the various components have to work in synergy rather than sequentially, novel funding mechanisms for various stages need to be in place with the flexibility required to fund various partners in an enterprise model. Some of these are already available like the BIPP and Small Business Innovation Research Initiative (SBIRI) mechanisms of DBT, and New Millennium Indian Technology Leadership Initiative (NMITLI) program of CSIR are available for industrial development of lead candidates.

More flexible granting mechanisms, unlike the milestone based, short-term, project-specific funding currently followed, are needed for vaccine R&D. The innovative funding mechanisms lasting for 5-8 yrs should be instituted for young investigators interested in vaccine development including flexible mechanisms for training in related areas like Good Laboratory/ Clinical/Manufacturing practices ethics (Including IPR) and hands on skill development in certain technology platforms.

Product development for public health emergency

There is a need to develop mechanisms, where speedy regulatory clearances are possible including flexibilities in the import of biological materials needed for such development. The mechanisms need to be evolved where the risk of the manufacturers is cushioned by appropriate assistance from the Government. It should be mandatory for the Government to support such developments with Advance Market Commitments and honour the commitments.

Vaccine quality regulatory system

The Central Drugs and Standards Control Organization (CDSCO) is the National Regulatory Authority (NRA) in India. CDSCO is headed by the Drugs Controller General (India) [DCG(I)]. It approves vaccines that are introduced in the country, grant permission to conduct clinical trials, registers and controls the quality of imported vaccines, as well as lays down standards for updating India Pharmacopoeia. It also approves licenses as the Central License Approving Authority (CLAA) for the manufacture of vaccines, coordinates the activities of the States and advises them on matters relating to uniform administration of the Act and Rules. The Central Drugs Laboratory (CDL), Kasauli performs lot release for all imported vaccines as well as locally produced vaccines.

Scope for Improvements in the quality assessments Indian vaccine industry has occupied an important niche in the manufacturing of EPI vaccines in the last decade. However, with the exception of measles vaccine, which is from a domestic WHO prequalified producer, all other NIP vaccines supplied are from WHO non pre-qualified manufacturers. This is in spite of the fact that India is one of the major suppliers to UN agencies of pre-qualified vaccines. The Indian vaccine industry has taken up new challenges of manufacturing more complex vaccines like the meningococcal conjugate vaccine, pneumococcal conjugate vaccine, and other combination vaccines. Recognizing this emerging strength of Indian manufacturers, the NRA should be appropriately strengthened with trained manpower, and an accredited laboratory which can serve as the National Control Laboratory. There are other areas, which need to be strengthened:

1) The current regulatory guidelines need to be updated;
2) Accreditation of laboratories for testing for vaccine should be in place. The institutions like the National Institute of Biologicals (NIB) need to be adequately strengthened;

3) India should develop prequalification standards that are in alignment with WHO-UNICEF standards.
4) Single window system should be in place to prevent any unnecessary delays in regulatory clearances.
5) There is a need to set up systems for fast-track clearance of vaccines needed for emergencies. One of the ways to achieve this is that Indian NRA recognizes the NRAs of other countries as is done by countries procuring vaccines through UNICEF. In situations where time is essence, having this types of provisions will go in a long way to save several lives during public health emergencies.

Clinical trials

Clinical trials are very crucial for decisions making about vaccine development. These should be planned and executed according to the Good Clinical Practices (GCP) guidelines and maintain highest standards possible. GCP training courses should be mandatory for all Principal investigators leading clinical trials.

1) There is a need to create a pool of trained investigators to design and oversee clinical trials for vaccines. The Clinical Development and Services Agency, within the Department of Biotechnology and its partners, which have this mandate, should be supported appropriately.
2) Capacity building for data management and biostatistics to analyze and interpret the results of a clinical trial is essential.
3) There should also be provision to engage trained auditors from time to time for independent assessment of vaccine trials conducted in the country.

Intellectual Property Rights (IPR) and technology transfer

The Indian Patent Act was amended in 2005 and the product patents have been allowed in the country, which has significant impact on the cost of health care products in India. Improving the institutional capacity for intellectual property (IP) management and technology transfer will help investigators involved in the research to understand the patent claims and will enable them to make sound judgments, during the product development. There are a few steps needed in this arena:

- Strengthening Indian patent office, reducing the time to examine and grant a patent, and creation of more comprehensive IP databases in India
- Encouraging technology transfer from multinational companies to develop products and gaining access to technologies and know-how
- Indian patent law may have provisions to permit compulsory licensing in special situations like the H1N1 pandemic or in situations, where a technology/intermediate is needed for vaccine development.
- The country should develop/use expertise to study the flexibilities enshrined in the Trade Related Aspects of Intellectual Property rights (TRIPS) agreement to reduce the negative impact of the patents. The arrangements like 'Bolar provision' which permits the manufacturers of generic pharmaceuticals to begin product development, while the patent is still in force. This could be particularly helpful in reducing the lead-time to obtain regulatory clearances during vaccine development.
- Collective management of IPR and open access agreements should be resorted to improve innovation and access. Innovations in ways to deal with IPR of new vaccines need to emerge through innovative funding of R&D.
- It is suggested that a body is created to acquire and hold IPR for technologies beneficial for use in public health. This body could then license the technology to emerging manufacturers on acceptable terms for development of vaccines and related products.

Vaccine production and supply

India is a major producer and exporter of vaccines: approximately 43% of global vaccine supply is provided by Indian manufacturers, primarily from the private sector. Till recently, both public and private sector vaccine producers were supplying vaccines to UIP. Domestic public sector need to be strengthened for production and supply. Similarly private sectors should be encourage to take up this challenge by providing enabling environment.

Introduction of new vaccines in UIP

The selection of vaccine for possible introduction in NIP is a complex process. There are a few laid down guidelines. The following criteria may be considered

before decision making about the introduction of new vaccine in UIP:

- Disease burden (incidence/prevalence, absolute number of morbidity/mortality, epidemic/ pandemic potential);
- Safety and efficacy of the vaccine under consideration;
- Affordability and financial sustainability of the vaccination program, even if the initial introduction is supported by the external funding agency;
- Program capacity to introduce a new antigen, including cold chain capacity;
- Availability of a domestic or external vaccine production capacity;
- The cost effectiveness of the vaccination program and also of the alternatives other than vaccination.

The Grades of Recommendation Assessment, Development and Evaluation (GRADE) system is one such system followed.

National Technical Advisory Group on Immunization (NTAGI) is a group of experts from vaccination and immunization related fields in India. The guidelines of international bodies like World Health Organization Strategic Advisory Group of Experts (WHO-SAGE) should be assessed in context of the capacity of India's National Immunization program to absorb a particular vaccine. The inputs from translational research in the country to support such introduction should be improved. Capacity and infrastructure in this field should be created/revamped. The interdisciplinary collaborations within the nation and at global level need to be initiated and established. The members of NTAGI should have sufficient interaction with each other and other global advisory bodies.

The NTAGI should be supported by subgroups that look into specific areas such as vaccine security, vaccine ethics, equity, financial sustainability, and improvements in health system.

The NTAGI should have wider representation to include experts from the areas of Public health, Paediatrics, Epidemiology, Infectious Disease (ID), Clinicians other than ID, Immunologists, Medical Microbiologists, Cold chain experts/ logisticians, Statistic modelers, Social scientists, and Drug regulators. It is also important to have experts in ethics, health economics, and nursing/pharmacy from the field, immunization program managers, and representatives of the civil society etc. Other members should be ex-officio members from the Ministry of Health and Family Welfare. There may be also be representation from the State Ministry of Health.

OPERATIONALEFFICIENCYOF UIP

Coverage: The coverage of UIP vaccines in this country is >70% only in 11 states, 50-70% in 13 and below 50 % in the rest of the 8 states. The last group also happens to include the most populous states, which brings down the national average below 50%. This is an area of concern and issues need to be addressed to improve UIP program performance. An assessment of existing bottlenecks that impede success in UIP should be carried out by an independent agency. An in-depth assessment of the immunization systems in the states should be carried out to understand the better outcomes in a few versus the abysmal performance in others. Similarly, the neighboring country structures (e.g., Sri Lanka and Bangladesh etc.) should also be studied to learn from them.
Linking of the Geographical Information System (GIS) with UIP network can also be used to track delivery of vaccines.

The strengths and gains from National Rural Health Mission (NHRM) in improving coverage of vaccination in certain states should be consolidated. The ANMs should be adequately incentivized to contribute to increasing coverage

AEFI surveillance system: The vaccines are administered as preventive measures to healthy individuals particularly children. The adverse events following immunization (AEFI) should be handled effectively in order to maintain/restore public faith in immunization program. The national operational guidelines on AEFI surveillance has been updated in 2010 and widely disseminated. All states and districts are now required to constitute AEFI committees, which assist in streamlining the reporting mechanism, investigate the reported serious AEFI and are involved in the causality assessment. The capacity building in AEFI surveillance and case investigation should be done in the entire country. The Post Marketing

Surveillance (PMS) network being set in Maharashtra state should be used for strengthening AEFI surveillance in the entire country. Effective collaboration and effective communication between National Control Laboratory, the National Immunization Program (NIP), and DCGI office should be established and quick identification and resolution of a vaccine batch related problem. The Central Drug Laboratory at Kasauli, which is currently used for testing for vaccine samples in AEFI, should be upgraded and efforts should be made to get NABL certification.

The national AEFI secretariat needs to be set in India. This may be established at National Centre for Diseases Control or similar identified institution. This secretariat would establish the links with the Brighton Collaboration and Global Advisory Committee on Vaccine Safety (GACVS) to further strengthen AEFI surveillance in India.

VPD surveillance: Vaccine Preventable Diseases (VPD) surveillance system in India is weak and needs to be strengthened to create an evidence base to enable planning and deployment of effective interventions. India has different surveillance models. Integrated Disease Surveillance Project (IDSP) is one of those surveillance systems. IDSP is a case-based surveillance system for detection of early warning signals of outbreaks. There are other sentinel surveillance systems which falls under different vertical national health programs for diseases targeted for control, elimination or eradication. Surveillance system need to be updated and should be based on models followed in other countries like Brazil, United States of America, European states. Environmental surveillance using technology like Geographical Imaging System (GIS) and Remote Sensing (RS) should also be used to support sentinel surveillance.

The National Polio Surveillance Project (NPSP) has done extremely well in acute flaccid paralysis (AFP) surveillance in India. WHO/NPSP provides needed technical and training support for AFP and measles.

Vaccine forecasting, procurement and management

All UIP vaccines are purchased at the central level for distribution to the states. The procurement of vaccines in GoI is done under the broad overarching General Financing Rules (GFR). The vaccines are purchased using Annual Rate Contracts (as per GFR) against which Supply Orders are issued. Parallel contracts are awarded for most vaccines, because no single domestic manufacturer has enough available production capacity to cover the entire annual requirement. But there should be transparent evaluation criteria and effective contract monitoring systems need to be instituted along with establishment of an independent evaluation committee. Procurement timing should be more realistic. Quantities and delivery schedules for procurement of AD syringes must match vaccine quantity and delivery schedules.

Vaccine wastage

An assessment of vaccine wastage in India, conducted in 2009 revealed that wastage rates depended on formulation, presentation and was inversely proportional to session size. Both cold chain requirement and vaccine wastage is expected to increase several fold with the introduction of newer vaccines compared to the UIP vaccines. Smaller dose vial is recommended for vaccines that have only one dose in the UIP schedule (e.g. Single dose for birth dose of HepB), and 2- 5 dose vials for the newer & more expensive vaccines). A huge amount of vaccine is damaged in the primary stores, which is beyond the scope of vaccine wastage study, needs to be analyzed.

Cold chain management

Cold chain storage capacity in India has improved in recent years. A nationwide cold chain assessment in 2008 revealed the shortage of cold chain equipment, of space allocation, and lack of preventive /corrective measures for breakdown of installed cold chain equipment facilities in immunization centers and storage facilities. The shortage of appropriately trained manpower to manage the cold chain logistics and equipment is another challenge.

These cold chain management challenges can be addressed by:

- Regional cold chain training cum support units should be established by GOI to provide appropriate support to the states.
- Mechanisms and systems in place for independent auditing of cold chain capacity,
- Developing some basic standards of storage and vaccine stores as per the global standard and need to be circulated to the states

- Regular self assessment of cold chain and vaccine management using standard global Effective Vaccine Management tool.

Vaccine stockpile in disaster and outbreak situation

The growing need is being felt to stockpile of vaccines against certain diseases with potential to cause outbreaks such as Cholera, JE and H1N1 and other seasonal influenza. These vaccines are required for an affected target population and the quantity needed for stockpile should be assessed together with the National Disaster Management Agency (NDMA).

Human resource

The UIP in India is among the largest immunization program in the world, targeting 2.7 Crore infants and 3.0 Crore pregnant women. The program is administered by the Immunization Division of the MoHFW, GoI. Several assessments have revealed the shortage of appropriately trained human resource for immunization services at all levels in the country. Capacity building needs to be supported on a sustainable basis. The existing system should be equipped to handle the new vaccine introductions. The central immunization division needs to be much larger and expansion needs to be looked into in terms of functional categories: Data analysis and policy, management for vertical programs, cold chain, research and communication etc.

Expansion of public health cadre at the central level to enable induction of more officers from the cadre as immunizations managers both at the immunization Division at the Centre and at the State level is much needed. The Tamil Nadu example, where an Independent Public Health Department with clear lines of supervision, needs to be studied for scale-up. Health is a state subject. A clear co-ordination mechanism needs to be in place in consonance with central program. A policy for better state-center co-ordination in vaccine should be adopted maintaining the state autonomy and creating a structure to coordinate.

Advocacy and communication

Advocacy and communication efforts are as important for community acceptance of the new vaccine as also for maintaining their confidence in the existing vaccines. This is especially important for situations where a few serious adverse events following immunization are reported. In the community, there are always people who have concerns regarding vaccines- either perceived or real.

Ethics and equity

The ethical use and equitable access to prevention and care should be the basic mantra of any program meant for ameliorating disease burden in the country. The new vaccines, which are relatively expensive than traditional vaccines, are commonly used by the upper and middle class families through personal resources from the private market. The children of poor families, which can't afford these vaccines, are at disadvantage and introduction of these new vaccines in NIP is an approach to make vaccine accessible to the poor and needy.

Public health benefits of vaccines in the mass immunization programs should always outweigh the adverse effects. The economic burden and inconvenience to the parents/family should always be factored in when planning.

IMPLEMENTATION AND MONITORING

There are multiple stakeholders, including national and state governments and development partners, in immunization program in India. The Union and state governments are involved in all aspects of program while the role of development partners are most often involved in providing technical assistance and support, rather than direct implementation. While the policy implementation will be monitored on the regular basis, this policy will be reviewed after periodic intervals, allowing changes to be made, which respond to the reality of then health policy environment in the country.

Reference

Govt. of India. National vaccine Policy 2011. Ministry of Health & Family Welfare, Govt. of India, Nirman Bhawan, New Delhi.

CHAPTER 47

NATIONAL BLOOD POLICY

INTRODUCTION

Blood Safety is vital for the prevention and control of blood transfusion transmitted infections. Unfortunately, the blood transfusion service in the country lacks many vital resources like manpower, adequate infrastructure and financial base beside poor management of private agencies. There is a wide gap in quality of services, between various states and cities. The blood component production/availability and utilization is extremely limited.

For quality, safety and efficacy of blood and blood products, well-equipped blood centers with adequate infrastructure and trained manpower is an essential requirement. Thus, a need for modification and change in the blood transfusion service has necessitated formulation of a National Blood Policy and development of a National Blood Program. The Supreme Court directive of May, 1996 has helped in phasing out unlicensed blood banks by May, 1997 and professional blood donors by December, 1997. Mandatory testing of blood for HIV along with Syphilis, Malaria Hepatitis B and C has helped in checking transmission of HIV virus through blood transfusion.

Mission Statement

- To ensure easily accessible and adequate supply of safe and quality blood and blood components collected / procured from a voluntary non-remunerated regular blood donor in well equipped premises, which is free from transfusion transmitted infections, and is stored and transported under optimum conditions.
- To ensure transfusion under supervision of trained personnel through comprehensive, efficient and a total quality management approach.

Objective—1

To reiterate firmly the Govt. commitment to provide safe and adequate quantity of blood, blood components and blood products

Strategy

- A national blood transfusion Program shall be developed to ensure establishment of nonprofit integrated National and State Blood Transfusion Services in the country.
- National Blood Transfusion Council (NBTC) shall be the policy formulating apex body in relation to all matters pertaining to operation of blood centers, formulating guidelines for regional centers, NGOs, private agencies, and also developing liaison with various ministries and Programs. National AIDS Control Organization (NACO) shall allocate a budget to NBTC for strengthening Blood Transfusion Service.
- State/UT Blood Transfusion Councils shall be responsible for implementation of the Blood Program at State/UT level, as per the recommendations and in full coordination with the

National Blood Transfusion Council. They shall develop action plan to ensure phasing out of replacement donors and achieving 100% voluntary donation.

- Mechanisms shall be developed to monitor and periodically evaluate the implementation of the National Blood Program in the country.
- State Blood Transfusion Councils shall organize the blood transfusion service through the network of Regional Blood Centers and Satellite Centers and other Government, Indian Red Cross Society & NGO run blood centers and monitor their functioning. The Regional Center shall act as a referral center for the region assigned to it.
- Enforcement of the standards of blood and blood products shall be the responsibility of Drugs Controller General India as per Drugs and Cosmetics Act/Rules. Special modifications for Armed Forces in remote border areas shall be made in the Act. Trading in blood i.e. Sale & purchase of blood shall be prohibited.

Objective—2

To make available adequate resources to develop and reorganize the blood transfusion service in the entire country

Strategy

- National & State/UT Blood Transfusion Councils shall be supported/ strengthened financially by pooling resources from various existing Programs and if possible by raising funds from international / bilateral agencies. Similarly, sustainability by making sufficient funds will be ensured for such transfusion services.
- The mechanism shall be introduced in government sector to route the amounts received through cost recovery of blood/blood components to the blood banks for improving their services.

Objective—3

To make latest technology available for operating the blood transfusion services and ensure its functioning in an updated manner

Strategy

- Standards, Drugs & Cosmetics Act/Rules and Indian Pharmacopoeia shall be updated as and when necessary and all mandatory tests shall be enforced. Inspectorate of Drugs Controller of India and State FDA shall be strengthened to ensure effective monitoring. A vigilance cell shall be created under Central/State Licensing Authorities.
- A Quality System Scheme and External Quality Assessment Scheme (EQAS) through the referral laboratories shall be introduced in all blood centers with efficient networking and bio-safety system. Quality Assurance Manager shall be designated at each Regional Blood Center/any blood center collecting more than 15,000 units per year to ensure quality control of Blood & its components in the region assigned. Standard Operating Procedures (SOPs) as a part of continuous improvement Program shall be adopted. Efforts shall be made towards indigenization of kits, equipment and consumables used in blood banks. Use of automation shall be encouraged to manage higher workload with increased efficiency.

Objective—4

To launch extensive awareness Programs for blood banking services including donor motivation, so as to ensure adequate availability of safe blood

Strategy

- Efforts shall be directed towards recruitment and retention of voluntary, non-remunerated blood donors through education and awareness Programs. Activities of NGOs shall be encouraged in this direction. All blood banks shall have donor recruitment officer/donor organizer and create a blood donor's directory. A Counselor in each blood center shall be appointed for pre and post donation counseling. National/State/UT Blood Transfusion Councils shall develop and launch an IEC campaign using all channels of communication including mass-media for promotion of voluntary blood donation and generation of awareness regarding dangers of blood from paid donors and procurement of blood from unauthorized blood banks/laboratories.

Objective—5

To encourage appropriate clinical use of blood and blood products

Strategy

- National Guidelines on **"Clinical use of Blood"**

shall be made available and updated as required from time to time. Effective and efficient clinical use of blood shall be promoted for that the Hospital Transfusion Committees are established in all hospitals to guide, monitor and audit clinical use of blood. Use of plasma expanders shall be promoted to minimize the use of blood.

- Medical Council of India shall be requested to take following initiatives:

(i) To introduce Transfusion Medicine as a subject at undergraduate and all post graduate medical courses;
(ii) To introduce posting for at least 15 days in the department of transfusion medicine during internship;
(iii) To include Transfusion Medicine as one of the subjects in calculating credit hours for the renewal of medical registration by Medical Council of India, if it is introduced; and
(iv) Blood and its components shall be prescribed only by a medical practitioner registered as per the provisions of Medical Council Act - 1956.

Objective—6

To strengthen the manpower through Human Resource Development

Strategy

- Transfusion Medicine shall be treated as a specialty. A separate Department of Transfusion Medicine shall be established in Medical Colleges. Medical Colleges/Universities in all States shall be encouraged to start PG degree (MD in transfusion medicine) and diploma courses in Transfusion Medicine. PG courses for technical training in transfusion medicine (PhD / MSc) shall also be encouraged. In all the existing courses for nurses, technicians and pharmacists, Transfusion Medicine shall be incorporated as one of the subjects. In-service and other training Programs on the basis of modules shall be organized for all categories of personnel working in blood centers as well as drug inspectors and other officers from regulatory agencies. Intercountry and intra-country exchange for training and experience of personnel associated with blood centers shall be encouraged to improve quality of Blood Transfusion Service.

Objective—7

To encourage Research & Development in the field of Transfusion Medicine and related technology

Strategy

- A corpus of funds shall be made available to NBTC/SBTCs to facilitate all types of research and development in transfusion medicine and technology related to blood banking.

- Computer based information and management systems shall be developed which can be used by all the centers regularly to facilitate networking.

Objective—8

To take adequate legislative and educational steps to eliminate profiteering in blood banks

Strategy

- For grant/renewal of blood bank licenses shall be based on reliable scrutiny as per the guidelines provided by Drugs Controller General India. Fresh licenses to stand-alone blood banks in private sector shall not be granted.
- A separate ***blood bank cell*** shall be created under a senior officer not below the rank of DDC (I) in the office of the DC (I) at the headquarter and at state/UT for proper inspection and enforcement.
- States/UTs shall enact rules for registration of nursing homes wherein provisions for affiliation with a licensed blood bank for procurement of blood for their patients shall be incorporated. Drugs & Cosmetics Rules will be periodically reviewed to introduce stringent penalties for unauthorized/ irregular practices in blood banking system.

Reference

Govt. of India. National Blood Policy. NACO, Ministry of Health & Family Welfare, GOI, New Delhi.

CHAPTER 48

NATIONAL POLICY FOR THE EMPOWERMENT OF WOMEN 2001

INTRODUCTION

Empowerment refers to "the process by which the powerless gain greater control over the circumstances of their lives". So women empowerment is that process in which women get equal control over the situations and resources through developing safe confidence and the ability to make decisions.

Gender disparity manifests itself in various forms, the most obvious being the trend of continuously declining female ratio in the population in the last few decades. Social stereotyping and violence at the domestic and societal levels are some of the other manifestations. Discrimination against girl children, adolescent girls and women persists in parts of the country. The underlying causes of gender inequality are related to social and economic structure, which is based on informal and formal norms, and practices.

The access of women particularly those belonging to weaker sections including Scheduled Castes/Scheduled Tribes/ Other backward Classes and minorities, majority of whom are in the rural areas and in the informal, unorganized sector – to education, health and productive resources, among others, is inadequate.

The principle of gender equality is enshrined in the Indian Constitution in its Preamble, Fundamental Rights, Fundamental Duties and Directive Principles. The National Commission for Women was set up by an Act of Parliament in 1990 to safeguard the rights and legal entitlements of women. The 73rd and 74th Amendments (1993) to the Constitution of India have provided for reservation of seats in the local bodies of Panchayats and Municipalities for women, laying a strong foundation for their participation in decision making at the local levels.

India has also ratified various international conventions and human rights instruments committing to secure equal rights of women. The Mexico Plan of Action (1975), the Nairobi Forward Looking Strategies (1985) where concept of empowerment was introduced, the Beijing Declaration as well as the Platform for Action (1995) and the Outcome Document adopted by the UNGA Session on Gender Equality and Development & Peace for the 21st century, titled "Further actions and initiatives to implement the Beijing Declaration and the Platform for Action" have been unreservedly endorsed by India for appropriate follow up. Key among them is the ratification of the Convention on Elimination of All Forms of Discrimination Against Women (CEDAW) in 1993.

However, there still exists a wide gap between the goals enunciated in the Constitution, legislation, policies, plans, Programs, and related mechanisms on the one hand and the situational reality of the status of women in India, on the other.

Goal

- To bring about the advancement, development and empowerment of women.

Objectives

1. To create an environment through positive economic and social policies for full development of women to enable them to realize their full potential;
2. The *de-jure* and *de-facto* enjoyment of all human rights and fundamental freedom by women on equal basis with men in all spheres – political, economic, social, cultural and civil;
3. Equal access to participation and decision making of women in social, political and economic life of the nation;
4. Equal access to women to health care, quality education at all levels, career and vocational guidance, employment, equal remuneration, occupational health and safety, social security and public office etc.;
5. Strengthening legal systems aimed at elimination of all forms of discrimination against women;
6. Changing societal attitudes and community practices by active participation and involvement of both men and women;
7. Mainstreaming a gender perspective in the development process;
8. Elimination of discrimination and all forms of violence against women and the girl child; and
9. Building and strengthening partnerships with civil society, particularly women's organizations.

POLICY PRESCRIPTIONS

Judicial Legal Systems: New laws will be enacted and existing laws reviewed to ensure that justice is quick and the punishment given to the culprits is commensurate with the severity of the offence domestic violence and personal assault.

The Policy would aim to encourage changes in personal laws such as those related to marriage, divorce, maintenance and guardianship so as to eliminate discrimination against women; changes in laws relating to ownership of property and inheritance by evolving consensus in order to make them gender just.

Decision Making: All measures will be taken to guarantee women equal access to and full participation in decision making bodies at every level, including the legislative, executive, judicial, corporate, statutory bodies, as also the advisory Commissions, Committees, Boards, Trusts, etc. Affirmative action such as reservations/quotas, including in higher legislative bodies, will be considered.

Mainstreaming a Gender Perspective in the Development Process: Women specific interventions in all policies, Programs and system would be launched.

Economic Empowerment of women: Economic independence of women provides strength to her personality, dignity, and overall development. Several action Programs for this purpose has been proposed:

- *Poverty Eradication Program:* Offering a range of economic and social options for women particularly poor would be initiated.
- *Micro Credit:* The establishment of new, and strengthening of existing micro-credit mechanisms and micro-finance institution for women particularly who are below poverty line need to be done to enhance women's access to credit for consumption and production,.
- *Women and Economy:* Women's contribution to socioeconomic development as producers and workers will be recognized in the formal and informal sectors (including home based works) and appropriate policies relating to employment and to her working conditions will be drawn up.
- *Globalization:* Is the new challenge in which women's employment and workplace safety to be ensured.
- *Women and Agriculture:* As producers, the Programs for training in soil conservation, social forestry, dairy development and other occupations allied to agriculture like horticulture, livestock including small animal husbandry, poultry, fisheries etc. will be expanded to benefit them.
- *Women and Industry:* Women in electronics, information technology and food processing and agro industry and textiles would be given comprehensive support in terms of labor legislation, social security and other support services. Suitable measures for example support services for security, transportation, etc., will be taken to enable women to work on the night shift in factories.

- *Support Services:* The provision of support services for women, like child care facilities, including crèches at work places and educational institutions, homes for the aged and the disabled will be expanded and improved.

Social Empowerment of Women: Current social strategy does not favored women to grow and develop normally. Various means including the following need to be implemented for social empowerment:

- *Education:* Special measures will be taken to eliminate discrimination, universalize education, eradicate illiteracy, create a gender-sensitive educational curricula and system, increase enrolment and retention rates of girls, and improve the quality of education to facilitate lifelong learning as well as development of occupation/vocation/ technical skills of women. A special focus on girls and women, particularly those belonging to weaker sections including the Scheduled Castes/Scheduled Tribes/Other Backward Classes/Minorities would be given.
- *Health:* This policy reiterates the national demographic goals for Infant Mortality Rate (IMR), Maternal Mortality Rate (MMR) set out in the National Population Policy 2000. Women should have access to comprehensive, affordable and quality health care. Reproductive rights of women would be ensure to enable them to exercise informed choices, their vulnerability to sexual and health problems together with endemic, infectious and communicable diseases such as malaria, TB, and water borne diseases as well as hypertension and cardiopulmonary diseases. The social, developmental and health consequences of HIV/ AIDS and other sexually transmitted diseases will be tackled from a gender perspective.

  To have access to safe, effective and affordable methods of family planning of their choice and the need to suitably address the issues of early marriages and spacing of children, compulsory registration of marriage and elimination of child marriage by 2010 would be the main agenda. Strict implementation of registration of births, deaths and marriages would be made compulsory. Women's traditional knowledge about health care and nutrition would be documented and encouraged to use.
- *Nutrition:* Special efforts will be made to tackle the problem of macro and micro nutrient deficiencies especially amongst pregnant and lactating women as it leads to various diseases and disabilities. Intra-household discrimination in nutritional matters vis-à-vis girls and women will be sought to be ended through appropriate strategies like nutrition education.
- *Drinking Water and Sanitation:* There is a need for the provision of safe drinking water, sewage disposal, toilet facilities and sanitation within accessible reach of households, especially in rural areas and urban slums. Women's participation will be ensured in the planning, delivery and maintenance of such services.
- *Housing and Shelter*: Special attention will be given for providing adequate and safe housing and accommodation for women including single women, heads of households, working women, students, apprentices and trainees.
- *Environment:* The vast majority of rural women still depends on the locally available noncommercial sources of energy such as animal dung, crop waste and fuel wood. To ensure the efficient use of fuels and other resources in environmental friendly manner, the women will be involved in spreading the use of solar energy, biogas, smokeless chulahs and other rural application.
- *Science and Technology:* A greater involvement of women in science and technology particularly girls for higher education, training them in communication and information technology and in development projects would be ensured.
- *Women in Difficult Circumstances:* women in extreme poverty, destitute women, women in conflict situations, women affected by natural calamities, women in less developed regions, the disabled widows, elderly women, single women in difficult circumstances, women heading households, those displaced from employment, migrants, women who are victims of marital violence, deserted women and commercial sex workers, etc., would be given special attention.

Violence against women: All forms of violence against women, physical and mental, whether at domestic or societal levels, including those arising from customs, traditions or accepted practices shall be dealt with effectively with a view to eliminate its incidence.

Rights of the Girl Child: Strict enforcement of laws against prenatal sex selection and the practices of female feticide, female infanticide, child marriage, child abuse and child prostitution, etc., removal of discrimination in the treatment of the girl child within the family and outside and projection of a positive image of the girl child will be actively fostered.

Mass Media: It will be used to portray images consistent with human dignity of girls and women. The Policy will specifically strive to remove demeaning, degrading and negative conventional stereotypical images of women and violence against women in media.

Operational Strategies

Action Plans

Central and State Ministries will draw up time bound Action Plans in consultation with Center/State Departments of Women and Child Development and National /State Commissions for Women that will include following measures:

1. Measurable goals to be achieved by 2010 and development of Gender Development Indices (GDI);
2. Identification and commitment of resources;
3. Responsibilities for implementation of action points;
4. Structures and mechanisms to ensure efficient monitoring, review and gender impact assessment of action points and policies and Gender auditing;
5. Introduction of a gender perspective in the budgeting process.

Institutional Mechanisms

National and State Councils will be formed to ensure implementation of the Policy on a regular basis. The National Council will be headed by the Prime Minister and the State Councils by the Chief Ministers and will be broad in composition having representatives from the concerned Departments/Ministries, National and State Commissions for Women, Social Welfare Boards, representatives of Non-Government Organizations, Women's Organizations, Corporate Sector, Trade Unions, financing institutions, academicians, experts and social activists etc. These bodies will review the progress made in implementing the Policy twice a year. The National Development Council will also be informed of the progress of the Program undertaken under the policy from time to time for advice and comments.

National and State Resource Centers on women will be established with mandates for collection and dissemination of information, undertaking research work, conducting surveys, implementing training and awareness generation Programs, etc. Self-Help Groups (SHGs) at the Anganwadi/Village/Town level will be registered as societies.

Resource Management

1. Adequate resource allocation to develop and promote the policy by concerned departments, financial credit institutions, banks, private sector, civil societies etc.;
2. Developing synergy between personnel of Health, Rural Development, Education and Women & Child Development Department at field level;
3. Women's Component Plan ensuring that not less than 30% of benefits/funds flow to women from all Ministries and Departments will be implemented effectively
4. The Department of Women and Child Development would be the nodal Ministry and will monitor and review the progress of the implementation of the Component Plan from time to time, in terms of both quality and quantity in collaboration with the Planning Commission.

LEGISLATION

All existing laws including personal, customary and tribal laws, subordinate legislation, related rules as well as executive and administrative regulations to eliminate all gender discriminatory references will be reviewed by National Commission for Women and Department of Women and Child Development.

Following specific measures will be taken to implement the legislation effectively:

1. Strict enforcement of all relevant legal provisions and speedy redressal of grievances;
2. Measures to prevent and punish sexual harassment at the place of work, protection for women workers in the organized/ unorganized sector and strict enforcement of relevant laws such as Equal Remuneration Act and Minimum Wages Act;
3. Crimes against women will be reviewed regularly. Recognized, local, voluntary organizations will be authorized to lodge Complaints and facilitate registration, investigations and legal proceedings;
4. Women's Cells in Police Stations, Encourage Women Police Stations, Family Courts, *Mahila*

Courts, Counseling Centers, Legal Aid Centers and *Nyaya Panchayats* will be strengthened; and
5. Widespread dissemination of information.

Gender Sensitization

Training of personnel of executive, legislative and judicial wings of the State will be carried out to sensitize for gender issues. Society will be made aware of gender issues and women's human rights through reframing and reviewing curriculum, educational materials and special mass campaign.

Panchayati Raj Institutions

These will be actively involved in the implementation of provisions given in the 73rd and 74th Amendments (1993) in the Indian Constitution.

Partnership with the voluntary sector organizations

Partnership for education, training and research in the formulation, implementation, monitoring and review of all policies and Programs affecting women would be established.

International Cooperation

Convention on All Forms of Discrimination Against Women (CEDAW), Convention on the Rights of the Child (CRC), International Conference on Population and Development (ICPD+5) and other such instruments will continue to share experiences, exchange of ideas and technology, networking with institutions and organizations and through bilateral and multilateral partnerships.

COMMENTS

Neglected areas for women empowerment are health, education, and employment that need greater share. Legal provisions for women rights are enshrined in Indian Constitutions in Article 14 (gender equality), 15 (prohibit discrimination), 16 (equal opportunities in public appointment), 39 (state responsibility to provide livelihood with equal pay for equal work), 42 (just and human conditions of work and maternity relief and 51 (A) (renounce the practices derogatory to the dignity of women).

In order to protect the constitutional rights of the women, the government has enacted many women specific and women related legislations from time to time:

- The Factories Act 1948;
- The Employee State Insurance Act 1948;
- The Special Marriage Act 1954;
- Hindu Succession Act 1954;
- The Equal Remuneration Act 1955 amended in 1976;
- The Hindu Marriage Act 1955 amended in 1986;
- The Immoral Traffic Act 1956 amended in 1986;
- The Maternity Benefit Act 1961;
- Hindu Adoption and Maintenance Act 1956;
- The Medical Termination of Pregnancy Act 1971;
- The Contract Labor (Regulation and Control) Act 1976;
- The Child Marriage restraint (Amended) Act 1976;
- The Dowry Prohibition Act 1956 amended in 1984;
- Indecent Representation of Women (Prohibition) Act 1986;
- Commission of Sati (Prevention) Act 1987;
- Pre-Natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act 1992;
- The National Commission of Women Act 1990;
- 73rd and 74th Amendments in the Constitution of India to provide reservation of seats for women in *Panchayat* and Municipalities
- Indian Penal Court also has many sections which provide legal protection from exploitation, torture, rape, sexual harassment, kidnapping, homicides due to dowry, adultery, etc.

The NPEW 2001 has been the outcome of various international and national deliberations and India's commitment to conform all the United Nations resolution concerning to women empowerment. Reservation of women in local governing bodies like, Panchayat, and Municipalities through 73rd and 74th amendment of Indian Constitutions is a positive step and need to be strengthened by further providing reservation in both the houses of Parliament. Policy indicates good intention of the India to empower women. However, recent statistics either on sex ratio or violence against women is not favorable. Many of the provisions in the policy are just repetitions of what it has already done. Policy envisages new legislation for empowering women is not appropriate proposal because there are already more than a dozen of legislations available. Policy has no time bound goals and measurable indicators set for implementation.

BETI BACHAO BETI PADHAO

The Census (2011) data showed a significant declining trend in the Child Sex Ratio (CSR), calculated as

number of girls for every 1000 boys between age group of 0-6 years, with an all time low of 918 in 2011 from 976 in 1961. The decline in CSR has been unabated since 1961. This is an alarming indicator for women disempowerment. It reflects both pre birth discrimination manifested through gender biased sex selection, and post birth discrimination against girls. The decline is widespread across the country and has expanded to rural as well as tribal areas.

2. Alarmed by the sharp decline, the Government of India has introduced Beti Bachao, Beti Padhao (BBBP) programme to address the issue of decline in CSR in 100 gender critical districts. Coordinated & convergent efforts are needed to ensure survival, protection and education of the girl child.

3. The Overall Goal of the Beti Bachao, Beti Padhao(BBBP) Scheme is to Celebrate the Girl Child & Enable her Education . The objectives of the Scheme are as under :-

- Prevent gender biased sex selective elimination
- Ensure survival & protection of the girl child
- Ensure education of the girl child

4. The Beti Bachao Beti Padhao (BBBP) initiative has two major components. i) Mass Communication Campaign and ii) Multi-sectoral action in 100 selected districts (as a pilot) with adverse CSR, covering all States and UTs.

(a) Mass Communication Campaign on Beti Bachao Beti Padhao The campaign aims at ensuring girls are born, nurtured and educated without discrimination to become empowered citizens of this country. The Campaign interlinks National, State and District level interventions with community level action in 100 districts, bringing together different stakeholders for accelerated impact.

(b) Multi-Sectoral interventions in 100 Gender Critical Districts covering all States/UTs:-

Coordinated & convergent efforts are undertaken in close coordination with MoHFW and MoHRD to ensure survival, protection and education of the girl child. The District Collectors/Deputy Commissioners (DCs) lead and coordinate actions of all departments for implementation of BBBP at the District level. Mulit-sectoral interventions includes:

i) Ministry of WCD: Promote registration of pregnancies in first trimester in Anganwadi Centres (AWCs); Undertake training of stakeholders; Community mobilization & "sensitization; Involvement of gender champions; Reward & recognition of institutions & frontline workers.

ii) Ministry of Health & Family Welfare: Monitor implementation of Pre-Conception and Pre-Natal Diagnostic Techniques (PCP&DT) Act, 1994; Increased institutional deliveries; Registration of births; Strengthening PNDT Cells; Setting up Monitoring Committees

iii) Ministry of Human Resource Development: Universal enrolment of girls; Decreased drop-out rate; Girl Child friendly standards in schools; Strict implementation of Right to Education (RTE); Construction of Functional Toilets for girls.

5. Social Media Presence:

- YouTube: www.youtube.com/user/Beti Bachao Beti Padhao
- MyGov: www.mygov.in/group_info/beti-bachao-beti-padhao
- Vikaspedia:www.vikaspedia.in/social-welfare/women-and-child-development/betibachao-beti-padhao

6. More Information:

- Scheme details - http://wcd.nic.in/BBBPScheme/main.htm
- Implementation Guidelines – www.wcd.nic.in/BBBPScheme/ImplementationguidelinesofBBBPScheme.pdf
- Trainer's Training Module: http://wcd.nic.in/BBBPScheme/trainingmodule.htm

Reference

Govt. of India. National Policy for Empowerment of Women 2001. Dept. of Women and Child Development Ministry of Social Justice and Empowerment, GOI New Delhi.
http://wcd.nic.in/BBBPScheme/About_BBBP_Scheme.pdf

CHAPTER 49

NATIONAL POLICY FOR CHILDREN 2012

The Union Cabinet today gave its approval to the National Policy for Children, 2012. The Policy reaffirms the government's commitment to the realisation of the rights of all children in the country. It recognizes every person below the age of eighteen years as a child and that childhood is an integral part of life with a value of its own, and a long term, sustainable, multi-sectoral, integrated and inclusive approach is necessary for the harmonious development and protection of children.

The policy lays down the guiding principles that must be respected by national, state and local governments in their actions and initiatives affecting children. Some of the key guiding principles are: the right of every child to life, survival, development, education, protection and participation; equal rights for all children without discrimination; the best interest of the child as a primary concern in all actions and decisions affecting children; and family environment as the most conducive for all-round development of children.

The policy has identified survival, health, nutrition, education, development, protection and participation as the undeniable rights of every child, and has also declared these as key priority areas.

As children's needs are multi-sectoral, interconnected and require collective action, the policy aims at purposeful convergence and strong coordination across different sectors and levels of governance; active engagement and partnerships with all stakeholders; setting up of a comprehensive and reliable knowledge base; provision of adequate resources; and sensitization and capacity development of all those who work for and with children.

A National Plan of Action will be developed to give effect to the policy and a National Coordination and Action Group (NCAG) will be constituted to monitor the progress of implementation. Similar plans and coordination and action groups will be constituted at the state and district levels. The National Commission for Protection of Child Rights and State Commissions for Protection of Child Rights are to ensure that the principles of the policy are respected in all sectors at all levels. There is a provision for review of the policy every five years. The Ministry of Women and Child Development will be the nodal ministry for overseeing and coordinating the implementation of the policy and will lead the review process.

NATIONAL CHARTER FOR CHILDREN 2003

INTRODUCTION

The health and social conditions of the children are not favorable for their growth and development. There is still large number of population suffers from poverty and illiteracy that have adverse health impacts especially on children. Protein Energy Malnutrition

(PEM), Iodine Deficiency Disorder, Vitamin deficiency and Iron deficiency anemia are the major problems attacking more than half of the young child population in India. Large number of children are employed which directly and indirectly damaging their health. There is widespread exploitation of children for sex, and hazardous and nonhazardous work.

"The lives of children and women are the truest indicators of the strength of communities and nations. If the youngest and most vulnerable are left to find their way alone, a country violates the rights of its people and sabotages its future as an equal partner in the global economy." (Bellamy 2001). The rights of children and their healthy development are very well acknowledged in the Constitution of India that provides both in Chapter 3 and 4, the protection, safety, growth and development of children. These are as follows:

- The State shall make special provisions for children (Art 15 (3));
- No child below the age of 14 years shall be employed to work in a factory, mine or any other hazardous employment (Art. 24);
- The tender age of children is not abused and that citizens are not forced by economic necessity to enter avocations unsuited to their age or strength (Art. 39 e);
- Children are given opportunities and facilities to develop in a healthy manner and in conditions of freedom and dignity and that youth are protected against exploitation and against moral and material abandonment (Art. 39 f);

In 1974, the National Policy for Children was announced that committed to provide for adequate services to children, both before and after birth and throughout the period of growth, to ensure their full physical, mental and social development. Many Programs and legislations were started for healthy development of children. However, achievement is still far behind as compared to the developed nations.

In view of current status of children in India, government affirms that the State, Society, Community and Family have obligations towards children who deserve a sound sense of values which will ultimately directed towards preserving and strengthening the Family, Society and the Nation. Government affirms that by respecting the child, society is respecting itself. Therefore, government has announced the National Charter for Children, 2003.

Objectives

- To secure for every child its inherent right to be a child and enjoy a healthy and happy childhood,
- To address the root causes that negate the healthy growth and development of children,
- To awaken the conscience of the community in the wider societal context to protect children from all forms of abuse, while strengthening the family, society and the Nation.

Measure to Achieve Rights to Children

To awaken the conscience of the community to protect children from violation of their rights, while strengthening the family, society and the Nation. The policy and charter for children envisaged the following measures with rights of the children:

Survival, Life and Liberty

1 a The State and community shall undertake all possible measures to ensure and protect the survival, life and liberty of all children.

b In particular, the State and community will undertake all appropriate measures to address the problems of infanticide and foeticide, especially of female child and all other emerging manifestations that deprive the girl child of her right to survive with dignity.

Promoting High Standards of Health and Nutrition

2 a The State shall take measures to ensure that all children enjoy the highest attainable standards of health, and provide for preventive and curative facilities at all levels especially immunisation and prevention of micronutrient deficiencies for all children.

b The State shall take measures to cover, under primary health facilities and specialised care and treatment, all children of families below the poverty line.

c The State shall take measures to provide adequate pre-natal and post-natal care for mothers along with immunization against preventable diseases.

d The State shall undertake measures to provide for a national plan that will ensure that the mental health of all children is protected.

e The State shall take steps to ensure protection of children from all practices that are likely to harm the child's physical and mental health.

3 The State shall take steps to provide all children from families below the poverty line with adequate supplementary nutrition and undertake adequate measures for ensuring access to safe drinking water and environmental sanitation and hygiene.

Assuring Basic Minimum Needs and Security

4 a The State recognizes that the basic minimum needs of every child must be met, that foster full development of the child's faculties

b In order to ensure this, the State shall in partnership with the community provide social security for children, especially for abandoned children and street children.

c State and community shall try and remove the fundamental causes which result in abandoned children and children living on streets, and provide infrastructural and material support by way of shelter, education, nutrition and recreation.

Play and Leisure

5 The State and community shall recognise that all children require adequate play and leisure for their healthy development and must ensure means to provide for recreational facilities and services for children of all ages and social groups.

Early Childhood Care for Survival, Growth and Development

6 a The State shall in partnership with the community provide early childhood care for all children and encourage programs which will stimulate and develop their physical and cognitive capacities.

b The State shall in partnership with the community aim at providing a child care center in every village where infants and children of working mothers can be adequately cared for.

c The State will make special efforts to provide these facilities to children from SCs/STs and marginalised sections of society.

Free and Compulsory Primary Education

7 a The State recognises that all children shall have access to free and compulsory education. Education at the elementary level shall be provided free of cost and special incentives should be provided to ensure that children from disadvantaged social groups are enrolled, retained and participate in schooling.

b At the secondary level, the State shall provide access to education for all and provide supportive facilities from the disadvantaged groups.

c The State shall in partnership with the community ensure that all the educational institutions function efficiently and are able to reach universal enrolment, universal retention, universal participation and universal achievement.

d The State and community recognise that a child be educated in its mother tongue.

e The State shall ensure that education is child-oriented and meaningful. It shall also take appropriate measures to ensure that education is sensitive to the healthy development of the girl child and to children of varied cultural backgrounds.

f The State shall ensure that school discipline and matters related thereto do not result in physical, mental, psychological harm or trauma to the child.

g The State shall formulate special programs to spot, identify, encourage and assist the gifted children for their development in the field of their excellence.

Protection from Economic Exploitation and All Forms of Abuse

8 a The State shall provide protection to children from economic exploitation and from performing tasks that are hazardous to their well-being.

b The State shall ensure that there is appropriate regulation of conditions of work in occupations and processes where children perform work of a non-hazardous nature and that their rights are protected.

c The State shall move towards a total ban of all forms of child labour.

9 a All children have a right to be protected against neglect, maltreatment, injury, trafficking, sexual and physical abuse of all kinds, corporal punishment, torture, exploitation, violence and degrading treatment.

b The State shall take legal action against those committing such violations against children even if they be legal guardians of such children.

c The State shall in partnership with the community set up mechanisms for identification, reporting, referral, investigation and follow-up of such acts, while respecting the dignity and privacy of the child.

d The State shall in partnership with the community take up steps to draw up plans for the identification, care, protection, counselling and rehabilitation of child victims and ensure that they are able to recover, physically, socially and psychologically, and reintegrate into society.

10a The State shall take strict measures to ensure that children are not used in the conduct of any illegal activity, namely, trafficking of narcotic drugs and psychotropic substances, begging, prostitution, pornography or violence. The State in partnership with the community shall ensure that such children are rescued and immediately placed under appropriate care and protection.

b The State and community shall ensure protection of children in distress for their welfare and all round development.

c The State and community shall ensure protection of children during the occurrence of natural calamities in their best interest.

Protection of the Girl Child

11a The State and community shall ensure that crimes and atrocities committed against the girl child, including child marriage, discriminatory practices, forcing girls into prostitution and trafficking are speedily eradicated.

b The State shall in partnership with the community undertake measures, including social, educational and legal, to ensure that there is greater respect for the girl child in the family and society.

c The State shall take serious measures to ensure that the practice of child marriage is speedily abolished.

Empowering Adolescents

12. The State and community shall take all steps to provide the necessary education and skills to adolescent children so as to equip them to become economically productive citizens. Special programs will be undertaken to improve the health and nutritional status of the adolescent girl.

Equality, Freedom of Expression, Freedom to Seek and Receive Information, Freedom of Association and Peaceful Assembly

13. The State and community shall ensure that all children are treated equally without discrimination on grounds of the child's or the child's parents' or legal guardian's race, color, caste, sex, language, religion, political or other opinion, national, ethnic or social origin, disability, birth, political status, or any other consideration.

14 All children shall be given every opportunity for all round development of their personality, including expression of creativity.

15a Every child shall have the freedom to seek and receive information and ideas. The State and community shall provide opportunities for the child to access information that will contribute to the child's development.

b The State and community shall undertake special measures to ensure that the linguistic needs of children are taken care of and encourage the production and dissemination of child-friendly information and material in various forms.

c The State and community shall be responsible for formulating guidelines for the mass media in order to ensure that children are protected from material injuries to their well-being.

16 All children shall enjoy freedom of association and peaceful assembly, subject to reasonable restrictions and in conformity with social and family values.

Strengthening Family

17a Every child has a right to a family. In case of separation of children from their families, the State shall ensure that priority is given to re-unifying the child with its parents. In cases where the State perceives adverse impact of such a re-unification, the State shall make alternate arrangements immediately, keeping in mind the best interests and the views of the child.

b All children have a right to maintain contact with their families, even when they are within the custody of the State for various reasons.

c The State shall undertake measures to ensure that children without families are either placed for adoption, preferably intra-country adoption, or foster care or any other family substitute services.

d The State shall ensure that appropriate rules with respect to the implementation of such services are drafted in a manner that are in the best interest of the child and that regulatory bodies are set up to ensure the strict enforcement of these rules.

e All children shall have the right to meet their parents and other family members who may be in custody.

Responsibilities of Both Parents

18 The State recognises the common responsibilities of both parents in rearing their children.

Protection of Children with Disabilities

19a The State and community recognise that all children with disabilities must be helped to lead a full life with dignity and respect. All measures would be undertaken to ensure that children with disabilities are encouraged to be integrated into the mainstream society and actively participate in all walks of life.

b State and community shall also provide for their education, training, health care, rehabilitation, recreation in a manner that will contribute to their overall growth and development.

c State and community shall launch preventive programs against disabilities and early detection of disabilities so as to ensure that the families with disabled children receive adequate support and assistance in bringing up their children.

d The State shall encourage research and development in the field of prevention, treatment and rehabilitation of various forms of disabilities.

Care, Protection, Welfare of Children of Marginalized and Disadvantaged Communities.

20. The State and community shall provide care, protect and ensure the welfare of children from marginalized and disadvantaged communities, support them in preserving their identity, and encourage them to adopt practises that promote their best interest.

21. The State recognises that children from disadvantaged communities and weaker/ vulnerable sections of the society are in need of special interventions and support in all matters pertaining to education, health, recreation and supportive services. It shall make adequate provisions for providing such groups with special attention in all its policies and programs.

Ensuring Child Friendly Procedures

22. All matters and procedures relating to children, viz. judicial, administrative, educational or social, should be child friendly. All procedures laid down under the juvenile justice system for children in conflict with law and for children in need of special care and protection shall also be child-friendly.

References

The Gazette of India. National Charter for Children, 2003. Ministry of Human resource Development, Department of Women and Child Development, Govt. of India, New Delhi, 9th February, 2004

Bellamy C. The State of the World's Children 2001 (Back Cover). UNICEF 200.

Govt. of India. National Policy & Charter for Children 2001 Draft. Ministry of Social Justice and Empowerment, Govt. of India, New Delhi

CHAPTER 50

NATIONAL YOUTH POLICY

INTRODUCTION

Youth, in all ages, has been in the vanguard of progress and social change. If the youth are inspired they can face the challenge of economic development and technological progress with social justice. The youth of India, representing a third of population, constitute a vital and vibrant human resource. They have a right, as well as an obligation, to participate actively in national development and in shaping the Destiny of the nation, which is, in point of fact, their own destiny. Their problems are many and varied and their aspirations naturally high, in a country with a great past and greater promise for the future. The need, therefore, is to create increasing opportunities for them to develop their personality and their functional capability and thus make them economically productive and socially useful. Such opportunities have to be created on a large scale, to cover a wide spectrum of areas of human endeavor; and they have to be made available to youth of all strata of society, particularly the disadvantaged. All national programs should be directed to enable the youth to become a productive, self-confident and committed force for national development. These programs must create adequate facilities for the all round development of youth and assist in their striving for excellence in all fields.

For this an integral and their-disciplinary approach, involving both government departments and organizations and sectors outside the Government such as the family, educators, leaders, voluntary agencies and youth organizations. The Central and State Governments have to provide adequate mechanisms supportive of this process so the National Youth Policy designed.

The National Youth Policy 2003 reiterates the commitment of the entire nation to composite and all round development of the youth and seeks to establish an All India perspective to fulfill their legitimate aspirations. The policy defines youth who are in the age group of 13 to 35 years. This population is around 37% according to 1996 census projections and going to be 40% in 2016.

Objectives

The policy shall be directed towards the achievements of the following objectives:

1. To instill in the youth a deep awareness of and respect for the principles and values enshrined in the Constitution such as national integration, nonviolence, secularism and socialism;
2. To promote among the youth the awareness of historical and cultural heritage and imbue them with a sense of pride and national identify, together with a deep commitment towards their preservation, as well as the enrichment of the environment and ecology;
3. To help develop in the youth qualities of discipline, self-reliance, justice and fair-play, concern for

public, sporting spirit and above all, a scientific temper in their modes of thinking and action which, inter alia, will enable them to combat superstition, obscurantism and the numerous social ills that beset the Nation;

4. To facilitate access, for all sections of the youth, to health information and services and to promote a social environment which strongly inhibits the use of drugs and other forms of substance abuse, ward off disease (like HIV/AIDS), ensures measures for de-addiction and mainstreaming of the affected persons and enhances the availability of sports and recreational facilities as constructive outlets for the abundant energy of the youth.
5. To provide the youth with maximum access to education and training opportunities and to facilitate access to information in respect of employment opportunities and to other services, including entrepreneurial guidance and financial credit.
6. To make the youth aware of international issues and involve them in promoting world peace, understanding and a just international (global) economic order.
7. To develop youth leadership in various socioeconomic and cultural spheres and to encourage the involvement of nongovernment organizations, cooperatives and non-formal groups of young people; and to promote a major participatory role for the youth in the protection and preservation of nature, including natural resources, to channelize their abundant energies in community service so as to improve the environment and foster a scientific, inquisitive reasoning and rational attitude in the younger general and to encourage the youth to undertake such travel excursions as would better acquaint them with cultural harmony, amidst diversity, in India, and overseas.

Thrust Areas of the policy

1. Youth empowerment: Youth should be better equipped with requisite knowledge, skills and capabilities. They should get adequate nutrition, good health, protection from diseases, equality of opportunity and respect for human and fundamental rights.
2. Gender Justice: Gender equality with special emphasis on female youth through elimination of gender discrimination.
3. Intersectoral approach: Youth development is associated with many sectors and their involvement is also important for overall development.
4. Information and Research Network: Establishment of a well organized information and research network in regard to various formulation of focused youth development schemes and programs. National and state youth centers are activated for this work.

Target groups

Following groups of youth are targeted for action - Rural and tribal youths, out of school youth, adolescents particularly female adolescents, youth with disabilities and youth under special difficult circumstances like victims of trafficking, orphans and street children.

KEY SECTOR OF YOUTH

- Health and family welfare
- Education
- Training and Employment
- Preservation of environment, ecology and wild life
- Recreation and sports
- Arts and culture
- Science and technology and
- Civics and good citizenship

Health

The policy recognizes that a holistic approach towards health, mental, physical and spiritual, needs to be adopted after careful assessment of the health needs of the youth. The mean age of marriage in the rural areas was 21.56 years for males and 16.67 years for females. In the urban areas, the mean age for marriage was 24.32 year for male and 19.92 years for females. This indicates that majority of marriages are in age of adolescence.

Nutrition

There is a gap of intake of energies and protein and the recommended dietary daily allowance. Early pregnancy, discriminatory feeding practices against girls, cultural and social factors are leading to anemia, malnutrition, and other micronutrient deficiencies. There is need to take appropriate measures to control such deficiencies.

Health Education and Health Consciousness

Policy strongly recommend the introduction of health

education in schools and college curricula. A policy of minimum physical exercise for all should be propagated.

Mental Health

Depression, stress, suicidal tendencies and taking up drugs, alcohol and violence are common in youth who have failed in examination or love affairs uncertainty of career, due to burden of study. The policy advocates a system of education which teaches the youth to fight back rather than give in. State sponsored and free counseling services should be made available. A fair understanding of yoga and meditation should be propagated among youth.

HIV/AIDS, STD and Substance Abuse

Adolescents are more prone to develop HIV/AIDS, STD and substance abuse due to their nature of experimentation and vulnerability. They require proper treatment and counseling and education about these diseases should be the part of educational curriculum.

Population Education

Responsible sexual behavior can be promoted through education in family life issues and control of population. They should be sensitize about the correct age for marriage, for the first pregnancy, sufficient spacing between births and limiting the size of the family.

Implementation

Nodal Agency: The Ministry of Youth Affairs and Sports, Government of India will be the Nodal Agency in the Government of India for the implementation of the Policy and providing such guidance and assistance as may be required.

Monitoring: Systematic and scientific monitoring and evaluation of the implementation of the Policy will be done, to provide insights into the needs, and aspirations of the youth of different levels and to assess the impact of the programs and the expenditure thereon in relation to stated objectives.

Involvement of NGOs: Maximum participation by nongovernmental Institutions, public and private, will be encouraged,

Coordination

The most important component of the youth program will be the removal of the unemployment, both rural and urban, in educated and non-educated youth. This will be ensured by all these agencies, working in unison and in mutual consultation and coordination. The Ministry of Youth Affairs and Sports, Government of India, will make all efforts to serve as a clearing house of data, information and ideas germinate to process of coordination, while keeping in fact the independent operational aspects of each of the Agencies.

National Committee on Youth Policy and Programs is contemplated to review and assess various programs and schemes. This will advise the government on youth affairs.

A National Youth Development fund will be created with the help of NGOs and any contribution would be income tax exempted.

The policy will be reviewed after 5 years from the date of commencement of implementation.

COMMENTS

1. Emphasis on health of youth is not given in the policy document. Health is very important for their development and growth. Health and safety during the sports need to be highlighted.
2. Drug problems are common in youths especially during the sports and need to be handled properly.
3. For proper development nutrition is very important and require special emphasis in the policy.
4. All platforms of youth development should be used for sex education and contraceptive use to prevent AIDS/STDs and population growth.

References

Gupta JP, Sood AK. Contemporary Public Health. New Delhi: Apothecaries foundation 2005.

Govt. of India. National Youth Policy 1998. Ministry of Sports and Youth Affair, Govt. of India.

CHAPTER 51

NATIONAL POLICY FOR OLDER PERSONS (1999)

Demographic aging is the global phenomenon that has hit Indian structure also. People are living longer. Life expectancy at birth for males has shown a steady rise for 30 years from 42 years in 1951-60 to 63 years in 2008 and projected 67 years in 2011-16. From 1986-90 to 2011-16 in males it is increased 11 years whereas in females it is increased 9 years only. Incidence of widowhood is much higher among females 60+ than males of the same age group because it is customary to get married to men older than them. There are many other reasons for this difference such as living risky life style, smoking, alcoholism, working in risky occupations, etc. Elderly population which is one of the most vulnerable groups needs special attention. The National Policy for Older Persons is the outcome of this need. National policy seeks to assure older persons that their concerns are national concerns and they will not live unprotected, ignored or marginalized.

Goal

Goal of the policy is the well being of older persons. It aims to strengthen their legitimate place in society and help older persons to live laste phase of their life with purpose, dignity and peace.

Objectives

1. To encourage individuals to make various provisions such as health and social insurance for their own as well as their spouse's old age;
2. To encourage families to take care of their older family members;
3. To enable and support voluntary and nongovernmental organizations to supplement the care provided by the family, with greater emphasis on noninstitutional care;
4. To provide care and protection to the vulnerable elderly especially widows, frail, handicapped, abused and destitute elderly;
5. To provide health care facilities specially suited to the elderly;
6. To promote research and training facilities to train geriatric care givers and organizers of services for the elderly;
7. To continually evaluate and upgrade existing services and programs for older people;
8. To facilitate and strengthen inter sectoral partnerships in the field; and
9. To create awareness regarding elder persons to develop themselves into fully independent citizens.

Implementation Strategy

A. Preparation of Plan of Action for operationalization of the National Policy;
B. Setting up of Separate Bureau for Older Persons in Ministry of Social Justice & Empowerment.
C. Setting up of Directorates of Older Persons in the States;
D. Three Yearly Public Review of implementation of policy;
E. Setting up of a National Council for Older Persons headed by Minister for Social Justice & Empowerment (Representatives from Central

Ministries, States, Non-Official members representing NGOs, academic bodies, media and experts);

F. Establishment of Autonomous National Association of Older Persons; and

G Encouraging the participation of local self Government.

Steps Already Taken for Implementation of NPOP

Setting up of Council

A National Council for Older persons (NCOP) under the chairpersonship of the Minister of State for Social Justice & Empowerment has been set up consisting 39 members. The NCOP is the designated office for receiving suggestions, complaints and grievances from older persons. A seven-member working group has also been constituted from amongst the members of NCOP.

Aadhar

The Ministry has also commissioned "*Aadhar*", as a secretariat of the NPOP in 1999. It is being coordinated by "Agewell Foundation". *Aadhar* is an initiative in the direction of empowering the elderly population of India to find satisfactory solutions to the problems as per their felt needs through coordination of voluntary efforts and administrative initiatives. *Aadhar* is attending to requests for intervention received from all over the country. In addition to the regular activities, a process of identification has been initiated by *Aadhar* for setting up voluntary action groups in all 578 districts of the country for better implementation of ideas and to provide for older persons effectively at the local level. The Plan of Action 2000 - 2005 operationalizes the NPOP to take up various initiatives.

Old Age Social & Income Security (OASIS) Project

An eight-member expert committee was nominated to examine policy questions connected with old age and to make concrete recommendations for actions so that every young worker can build up enough savings during his/her working life, which would serve as a shield against poverty in their old age and reduce the burden on the state. The Social Defence Bureau is taking the necessary actions for the implementation of the recommendations of the report.

Reference

Government of India National Policy for Older Persons 1999. Ministry of Social Justice and Empowerment, GOI, New Delhi.

CHAPTER 52

NATIONAL POLICY FOR PERSONS WITH DISABILITIES

The National Policy recognizes that Persons with Disabilities are valuable human resource for the country and seeks to create an environment that provides them equal opportunities, protection of their rights and full participation in society. The focus of the policy shall be on the following:

I. Prevention of Disabilities

Program for prevention of diseases, which result in disability and the creation of awareness regarding measures to be taken for prevention of disabilities during the period of pregnancy and thereafter will be intensified and their coverage expanded.

II. Rehabilitation Measures

Rehabilitation measures can be classified into three distinct groups:

1. Physical rehabilitation, which includes early detection and intervention, counseling & medical interventions and provision of aids & appliances. It will also include the development of rehabilitation professionals.
2. Educational rehabilitation including vocational education and
3. Economic rehabilitation for a dignified life in society.

Physical Rehabilitation Strategies

(a) Early Detection of disability and Intervention

Drug or non-drug therapies help in minimization of impact of disability. Therefore, there will be emphasis on early detection and early intervention. Government will take measures to disseminate information regarding availability of facilities to the people especially in rural areas where interventions can be carried out.

The following action will be taken:

- National and Universal Immunization Program, public health and sanitation will be expanded for children and mother.
- Training of Medical and para-medical personnel to equipped for early detection of disability amongst children.
- Training modules and facilities in disability prevention for medical professionals and para-medical health functionaries and Anganwadi workers.
- Disability specific manuals for families.
- Human resource development institutions will ensure that the personnel needed to provide support services such as special education, clinical psychology, physiotherapy, occupational therapy, audiology, speech pathology, vocational counseling & training and social work are available in adequate numbers.
- The latest research findings in the field of genetics will be utilized appropriately to minimize congenital disability including mental illness.
- Improving awareness of nutrition, health care

and sanitation amongst adolescent girls, expectant mothers and women in the reproductive period.

- Programs will be undertaken for screening of children to identify at risk cases.

(b) Counseling & Medical Rehabilitation

Counseling, strengthening capacities of persons with disabilities and their families, physiotherapy, occupational therapy, psychotherapy, surgical correction and intervention, vision assessment, vision stimulation, speech therapy, audiological rehabilitation and special education shall be extended to cover all the districts in the country by active involvement and participation of State Governments, local level institutions, NGOs including associations of parents and persons with disabilities.

Currently, rehabilitation services are largely available in and around urban areas. Since 75% persons with disabilities live in rural areas, the services run by professionals will be extended to cover uncovered and un-served areas. Privately owned rehabilitation service centres shall be regulated for maintenance of minimum standards which shall be laid down.

To expand coverage in rural and unserved areas, new District Disability Rehabilitation Centres (DDRCs) will be set up with support from the State Government.

The National Rural Health Mission through Accredited Social Health Activist (ASHA) addresses the health needs of rural population, especially the vulnerable sections of society. The ASHA will be trained to take care of the comprehensive services to the persons with disabilities at the grass root level.

Community based Rehabilitation programmes shall be encouraged. Self help groups of persons with disabilities and their family members/ caregivers shall be effectively involved in the process of rehabilitation.

Setting up of mental health care homes for severely mental ill persons will be encouraged under district level Panchayati Raj institution with the involvement of NGOs. Alternatively, family support groups will be encouraged to setup Custodial Care Institutions for persons with mental disabilities without community and / or family support.

(c) Assistive Devices

The Government of India has been assisting persons with disabilities in procuring durable and scientifically manufactured, modern aids and appliances of ISI standard that can promote their physical, social and psychological independence by reducing the effect of disabilities. The government is providing devices such as prostheses and orthoses, tricycles, wheel chair, surgical footwear and devices for activities of daily living, learning equipments (Braille writing equipments, Dictaphone, CD player/ tape recorder), low vision aids, special mobility aids like canes for blind, hearing aids, educational kits, communication aids, assistive & alerting devices and devices suitable for the persons with mental disabilities.

Private, public and joint sector enterprises involved in the manufacture and distribution of high tech assistive devices for persons with disabilities will be provided financial support by the public sector banks.

(d) Development of Rehabilitation Professionals

Human resource development plan will be prepared so that the rehabilitation strategies do not suffer from lack of manpower.

2. Education for Persons with Disabilities

In keeping with the spirit of the Article 21A of the Constitution guaranteeing education as a fundamental right and Section 26 of the Persons with Disabilities Act, 1995, free and compulsory education has to be provided to all children with disabilities up to the minimum age of 18 years. According to the Census, 2001, 51% persons with disabilities are illiterate. There is a need for mainstreaming of the persons with disabilities in the general education system through Inclusive
education.

Sarva Shiksha Abhiyan (SSA) launched by the Government has the goal of eight years of elementary schooling for all children including children with disabilities in the age group of 6-14 years by 2010. Children with disabilities in the age group of 15-18 years are provided free education under Integrated Education for Disabled Children (IEDC) Scheme (100% sponsored). Under SSA, a continuum of educational options, learning aids and tools, mobility assistance, support services etc. are being made

available to students with disabilities. This includes education through an open learning system and open schools, alternative schooling, distance education, special schools, wherever necessary home based education, itinerant teacher model, remedial teaching, part time classes, Community Based Rehabilitation (CBR) and vocational education.

It will be ensured that every child with disability has access to appropriate pre-school, primary and secondary level education by 2020.

3. Economic Rehabilitation of Persons with Disabilities

Economic rehabilitation of Persons with disabilities comprise of both wage employment in organized sector and self-employment. Supporting structure of services by way of vocational rehabilitation centres and vocational training centres will be developed to ensure that disabled persons in both urban and rural areas have increased opportunities for productive and gainful employment.

(i) Employment in Government Establishments

The PWD Act, 1995 provides for 3% reservation in employment in the establishments of Government of India and Public Sector Undertakings (PSUs) against identified posts. The status of reservation for Government in various Ministries/ Departments against identified posts in Group A, B, C & D is 3.07%, 4.41%, 3.76% and 3.18% respectively. In PSUs, the reservation status in Group A, B, C & D is 2.78%, 8.54%, 5.04% and 6.75%, respectively.

(ii) Wage employment in Private sector

Pro-active measures like incentives, awards, tax exemptions etc. will be taken to encourage the employment of persons with disabilities in the private sector.

(iii) Self-employment

The Government will also encourage self-employment by providing incentives, tax concessions, exemptions from duties, preferential treatment for procurement of goods and services by the Government from the enterprises of persons with disabilities, etc.

III. Women with disabilities

According to Census-2001, there are 93.01 lakh women with disabilities, which constitute 42.46% of total disabled population. Women with disabilities require protection against exploitation and abuse. Special programs are required in education, employment, and vocation training. The Government has prlanned to to provide financial support to women with disabilities so that they may hire services to look after their children but that will be limited to two children for a period not exceeding two years.

IV Children with Disabilities

The Government would strive to: -

(a) Ensure right to care, protection and security for children with disabilities;

(b) Ensure the right to development with dignity and equality creating an enabling environment where children can exercise their rights, enjoy equal opportunities and full participation in accordance with various statutes.

(c) Ensure inclusion and effective access to education, health, vocational training along with specialized rehabilitation services to children with disabilities.

(d) Ensure the right to development as well as recognition of special needs and of care, and protection of children with severe disabilities.

V Barrier-free environment

Barrier-free environment enables people with disabilities to move about safely and freely, and use the facilities within the built environment. The goal of barrier free design is to provide an environment that supports the independent functioning of individuals so that they can participate without assistance, in every day activities. Therefore, to the maximum extent possible, buildings/ places/ transportation systems for public use will be made barrier free.

VI Issue of Disability Certificates

The Government of India has notified guidelines for evaluation of the disabilities and procedure for certification. The Government will ensure that the persons with disabilities obtain the disability certificates without any difficulty in the shortest possible time by adoption of simple, transparent and client-friendly procedures.

VII Social Security

Disability incur substantial additional expenditure for facilitating activities of daily living, medical care,

transportation, assistive devices, etc. Therefore, there is a need to provide them social security by various means. Central and State Government has been providing tax relief, unemployment allowance to persons with disabilities and their guardians. National Trust for persons with autism, cerebral palsy, mental retardation and multiple disabilities has been providing legal guardians through Local Level Committee. Supported Guardianship Scheme is started to provide financial security to person who take care of disabled persons.

VIII Promotion of Non-Governmental Organizations (NGOs)

The National Policy recognizes the NGO sector as they played a significant role in the provisions of services for persons with disabilities. Various schemes are started for them

IX Collection of regular information on Persons with Disabilities

There is a need for regular collection, compilation and analysis of data relating to socio-economic conditions of persons with disabilities. The National Sample Survey Organization has been collecting information on Socio-economic conditions of persons with disabilities on regular basis once in ten years since 1981. The Census has also started collection of information on persons with disabilities from the Census-2001. The National Sample Survey Organization will have to collect the information on persons with disabilities at least once in five years.

X Research

For improving the quality of life of persons with disabilities, research will be supported on their socio-economic and cultural context, cause of disabilities, early childhood education methodologies, development of user-friendly aids and appliances and all matters connected with disabilities which will significantly alter the quality of their life and civil society's ability to respond to their concerns.

XI Sports, Recreation and Cultural life

Persons with disabilities have right to access sports, recreation and cultural facilities. The Government will take necessary steps to provide them opportunity for participation in various sports, recreation and cultural activities.

XII Amendments to existing Acts dealing with the Persons with Disabilities

The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 needs modification as experienced gained from Rehabilitation Council of India and National Trust Acts will also be reviewed and if necessary, required amendments would be made.

Responsibility for Implementation

The Ministry of Social Justice & Empowerment will be the nodal Ministry to coordinate all matters relating to the implementation of the Policy.

An inter-ministerial body to coordinate matters relating to implementation of National Policy will be formed. All stakeholders including prominent NGOs, Disabled Peoples Organizations, advocacy groups and family associations of parents/ guardians, experts and professionals will also be represented on this body. Similar arrangements will be encouraged at the State and Districts levels.

Panchayati Raj Institutions and Urban Local Bodies will be associated in the functioning of the District Disability Rehabilitation Centres' District Level Committees to coordinate the matters relating to the implementation of the policy.

The Ministries of Home Affairs, Health & Family Welfare, Rural Development, Urban Development, Youth Affairs & Sports, Railways, Science & Technology, Statistics & Programme Implementation, Labour, Panchayati Raj and Departments of Elementary Education & Literacy, Secondary & Higher Education, Road Transport & Highways, Public Enterprises, Revenue, Women & Child Development, Information Technology and Personnel & Training will setup necessary mechanism for implementation of the policy. The Chief Commissioner for Disabilities at Central level and State Commissioners at the State level shall play key role in implementation of National Policy, apart from their statutory responsibilities. Every five years a comprehensive review will be done on the implementation of the National Policy.

CHAPTER 53

NATIONAL NUTRITION POLICY

INTRODUCTION

Nutrition affects growth and development of the person. There is a wide gap in food production and food consumption. Severity of nutrition problem can be predicted from the following estimates:

1. Approximately 27 % of the population is still living below poverty line.
2. As many as 46% children below 3 years of age suffer from underweight
3. 38% of these children are stunted and 19% are wasted.
4. Majority of rural and tribal children below 5 yeas of age suffer from malnutrition.
5. Roughly 79% under 3 years children and almost 58% of the expectant mothers in the third trimester of pregnancy suffer from anemia as reported in NFHS-III which is higher than previous findings in NFHS-II.
6. Anemia in men was 24% (NFHS-III).
7. Nutritional blindness affect 7 million children in India per year results mainly from the deficiency of Vitamin A, couples with PEM. Prevalence of conjunctival xerosis and Bitot's spot was observed as high as 7.8% among slum children, followed by industrial labor (6.3%).
8. Prevalence of Low Birth Weight babies in India ranged between 26% and 57% in the urban slums and 35% and 41% in rural areas.
8. In large parts of India, the rainy months are the worst months for the rural and landless poor. There are regions in the country which are almost every year affected by famines, droughts, and floods.
9. 33% of the women and 28% of the men suffer from low BMI.
10. There is a problem of overnutrition in certain areas and certain groups of people in the country which have a serious health effects. 15% of the women and 12% of the men were obese (NFHS-III).
11. Almost universal deficiency of Zinc in pregnant mothers in developing countries (Caulfield et al 1998).

POLICY

Goals

The National Nutrition Policy was adopted in 1993 with the following goals:

1. Reduction in the incidence of moderate and severe malnutrition and stunted growth among children;
2. Reduction in the incidence of low birth weight to less than 10%;
3. Elimination of blindness due to Vit. A deficiency
4. Reduction in the iron deficiency anemia among pregnant women to 25%;
5. Universal iodization of salt for reduction of iodine deficiency disorders to below the endemic level;
6. Special emphasis to geriatric nutrition;
7. Annual production of 250 million tonnes of food grain;
8. Improving household food security through poverty alleviation programs; and
9. Promoting appropriate diets and healthy life style.

"Malnutrition Free India" is the vision for National Nutrition Policy for the next decade as visioned by 11th Plan.

Interventions

A. **Direct Intervention** - Short term

- Nutrition Intervention for special vulnerable groups: Program for 0-6 year children, mothers, and adolescent girls for example ICDS.
- Fortification of Essential Foods: salt with iodine and or iron, Bread with iron, Vitamin A, and Fat with Vitamin A.
- Popularization of Low Cost Nutritious Food.
- Control of Micro-Nutrient Deficiency amongst vulnerable groups: e.g. Vit A Prophylaxis Program, National Nutritional Anemia Prophylaxis Program.

B. **Indirect Policy Instruments**: Long term institutional and structural changes

- Food security: To ensure aggregate food security, a per capita availability of 215/kg/yr of food grains needs to be attained,
- Improvement of dietary pattern through production and demonstration,
- Policies for effecting income transfers so as to improve the entitlement package of the rural and urban poor,
- Improving the purchasing power: e.g. Integrated Rural Development Program (IRDP), Jawahar Rozgar Yojana, Nehru Rozgar Yojana and Development of Women and Children in Rural Area (DWCRA), where 100 days job to laborers are provided.
- Public distribution system,
- Land reforms,
- Health and family welfare: e.g. "Health for all by 2000 AD" Program.
- Basic health and nutrition knowledge,
- Prevention of food adulteration,
- Nutrition surveillance: National Nutrition Monitoring Bureau (NNMB) and National Institute of Nutrition (NIN) will be responsible for nutritional surveillance,
- Monitoring of nutrition programs,
- Research,
- Equal remuneration,
- Communication: Department of Women and Child Development have well established communication division, and Ministry of Information and Broadcasting have been involved,
- Minimum wage administration,
- Community and participation,
- Education & literacy,
- Improvement of the status of women, and
- Intersectoral coordination

This policy have been implemented and administered by several ministries and departments of the Govt. of India and governmental and non-governmental organizations. A National Plan of Action on Nutrition (NPAN) was formulated in 1995 with sectoral commitments to be undertaken by 14 nutrition-related Ministries and departments viz., Agriculture, Food production, Civil supplies, Public distribution, Education, Forestry, Information & Broadcasting, Health & Family Welfare, Labor, Rural Development, Urban Development, Women and Child Development, etc. There is a inter-ministerial coordination committee, a National Nutrition Council for policy coordination, review and direction at the national level. Nutrition situation has been monitored by National Institute of Nutrition, National Institute of Health & Family Welfare, Central Health Education Bureau, and other agencies and NGOs. The Department of Women and Child Development, is the nodal agency responsible for implementation of the National Nutrition Policy.

National Nutrition Mission (NNM) which has been set up in 2002 with an overall responsibility of reducing/ eliminating both macro and micro nutritional deficiencies in the country. As part of the efforts of NNM, a new program to combat undernutrition among adolescent girls and expectant and nursing mothers is being launched by the Department of Women and Child development on pilot basis during 2002-03; covering two most backward district in each of the major states and most populous districts in rest of the smaller states and UTs. Under this pilot program, food grains are supplied free of cost through targeted public distribution system (PDS) directly to identified families with under /malnourished persons (Planning Commission 2002). Under this mission all the department must work forward to meet the goal of the policy in the next decade.

Constraints of National Nutrition Policy

- Malnutrition is till to be focused as a national problem.
- Nutrition does not have the status of a separate ministry nor even a department, and all existing departments have their own mandates.
- Nutrition is not seen as an explicit goal by the concerned sectors.
- Nutrition is invariably seen as synonymous with feeding.
- State level actions on nutrition policy instruments depend on directions supported by resource allocations.

In this mission mode approach following actions are recommended:

- Malnutrition to be viewed as impediment to national development at highest level.
- Silent emergency of malnutrition to be fought on war footing.
- Sustained political commitment needed.
- A high level standing intragency coordination mechanism must be created at center and state levels to direct macro and micro level strategies.
- Social sector-Nutrition, health, Education and women and child development must receive higher budgetary allocations.
- The problem of malnutrition must be made visible at different levels. There must be concentrated nutrition awareness, advocacy, communication and capacity building in respect of both the community and functionaries at various levels.
- The health sector should include nutrition in all spheres of its activities viz, medical education, training, primary health care, surveillance, etc.

COMMENTS

UN FAO has warned the goal of halving the number of undernourished people by 2015 can not be reached at present rate. It said India and Pakistan are among 17 countries where hunger has risen after falling steadily in early and mid 1990s (HT 26 Nov 2003 p 8). Recent report of NFHS-III indicates that the prevalence of underweight among children is not decreasing. The anemia in pregnant and children is increasing. This is a serious concerned for Indian nutrition program and policy. Globalization and modernization do not have any beneficial effect on the poor and under nourished people. From these observations it can be concluded that policy has failed to bring improvement in nutritional status of people. Unemployment rate has not gone down. 17% of the India's graduates are jobless and 40% of graduates are not productively employed according to recently released census figures. Even National food for work program the women are paid less as compared to their work (TOI 2005) so they suffer more from malnutrition.

References

Caulfield LE, Zavaleta N, Shankar AH, et al. Potential contribution of maternal zinc supplementation during pregnancy to maternal and child survival. Am J Clin Nutr 1998; 68 (Suppl): 499S.

Government of India. Ninth Five Year Plan 1997-2002. Planning Commission, GOI, New Delhi.

Government of India. Eleventh Five Year Plan 2007-2012. Planning Commission, GOI, New Delhi.

Gupta VM, Sen P. National Population Policy 2000: An insight (Editorial). Ind J Public Health 2000; 44 (1): 1-4.

Planning Commission. Tenth Five Year Plan 2002-2007 Vol II-Sectoral Policies and Programs. Govt. of India.

Times of India 2005; 22nd June.

CHAPTER 54

NATIONAL HEALTH RESEARCH POLICY

INTRODUCTION

Health research goes beyond illness to include the research into the various determinants of illness as well as health. Health research, therefore, is systematic generation of knowledge that can be used to promote, restore, maintain and/or protect health of individuals and populations.

The establishment of a Department of Health Research (DHR) in the Ministry of Health of recognition by the GOI of the key role that health research should play in the nation. The Report of India's National Commission on Macroeconomics and Health (NCMH) which builds a strong case for investing in indigenous research and encouraging Indian companies and universities in partnership to engage in R&D for drugs, medical devices and vaccines relevant to the needs of India's poor.

The fact that the almost 300 medical college in the country are not contributing of their best to health research is highlighted by the fact that in 2007. 96% of the research publications in India emanated from 9 medical colleges. Much of this published research is not on priority health concerns and the translational of key research findings into policy which could improve the health of the people is very limited and needs to be enhanced. With the launch of the National Rural Health Mission (NRHM) and the proposed National Urban Health Mission (NUHM). There is also a compelling need to build multidisciplinary research blending physical, medical and social sciences. Besides there is also an equal urgency to establish regulations, strict ethical norms and transparency, standardize methodology and international standards of research.

It is in this context that the DHR has formulated a National Health Research Policy. In India, while most of the agencies funding research have plans in general linked to the National 5-year Plans, a coordinated national health research policy which could guide the planning and implementation is not yet in place. The increasing international collaborative research in priority areas of national health also necessitates a clearly spelt out policy to ensure that the contributions of our International partners can enhance the ability of the partnership to improve national health. Some of the conflicts and failures of Indian health research can be attributed to the absence of such an overarching policy.

Achievements of Health Research in India

A common criticism of scientific activities in India in general, and of medical research in particular, has been that no significant achievements have occurred, particularly in the post - independence period. Major breakthroughs of the Nobel Prize winning kind require an investment and infrastructure that has been unaffordable by the country. However, there are several instances over the past fifty years that clearly

indicate that, in spite of the handicaps and difficulties, contributions have been made in the health sector through research done in India by Indians, which have significantly changed the health scenario. Some examples of such contributions would include:

1. The identification of emerging or reemerging infections (Kyasanur Forest Disease, *Vibrio cholerae* 0139, resurgence of leptospirosis, adult variants of measles);
2. Development of diagnostics (Japanese encephalitis, Dengue, Hepatitis A, Group A Rotavirus, Malaria, Kala Azar, 0139 cholera, Hepatitis C);
3. Development of vaccines (KFD, cholera, leprosy);
4. Major field evaluation of vaccines (leprosy, TB);
5. Development and operationalization of treatment regimens (short course chemotherapy for TB, supervised chemotherapy- now called DOTS- for TB, multi-drug therapy for leprosy, oral rehydration solution-ORS- for diarrhoeal diseases, Vitamin A prophylaxis for children to prevent nutritional blindness, iron and folic acid supplementation for pregnant women);
6. New drug development (Centchroman, Artether);
7. Development of strategies for delivery of services (pulse polio, DOTS, Integrated disease vector control, rheumatic fever / rheumatic heart disease);
8. Development of nationally appropriate guidelines (for tubal sterilization, assisted reproduction);
9. Generation of data (on dietary intakes, and nutritional status leading to formulation of recommended dietary allowances for Indians, nutritional value of Indian foods, magnitude of the problems of blindness, hearing impairment, cancer & mental illness, hemoglobinopathies);
10. Discovery of a rare blood group (the Bombay Group);
11. Preparation of a Genetic Atlas of Indian Tribes;
12. Demonstrating the safety, efficacy and cost-effectiveness of *Kshaarasootra* (an Ayurvedic Medicated Thread) technique as a nonsurgical ambulatory technique for management of fistula-in-ano;
13. Providing the basis for formulation of new programs for noncommunicable diseases (cancer, blindness, deafness, mental health) and
14. Developing the Ethical Guidelines for Biomedical Research on Human Subjects in India (1980 and 2000).
15. The contributions of the pharmaceutical industry in making available at affordable cost almost all drugs required by the Indian population.

These achievements clearly show that a policy driven investment in infrastructure and manpower development and a climate of scientific freedom that fosters initiative as envisaged in the National Science policy will increase the contributions of health research. This is essential to ensure that Health acts as a major catalyst of development.

Vision

To maximize the returns on investments in health research through creation of a health research system to prioritize, coordinate, facilitate conduct of effective and ethical health research and its translation into products, policies and programs aimed at improving health especially of the vulnerable populations.

Objectives

The broad objectives of the National Health Research Policy are:

i. Identify priorities for effective and ethical health research to enable the achievement of the objectives of NHP 2002, NRHM, Bharat Nirman and National Food security Act as well as global commitments such as MDG and IHR, ensuring that the results of health research are translated into action.
ii. Foster Inter-sectoral coordination in health research including all departments within the Government, Private Sector and the Academia to promote innovation and ensure effective translation to encourage/accelerate indigenous production of diagnostics, vaccines, therapeutics, medical devices etc.
iii. Focus on the marginalized, the vulnerable and the disadvantaged sections of society.
iv. Strengthen national networks between research institutes, academia and service institutes, and encourage PPP.
v. Put in place strategies and mechanisms for assessing the cost effectiveness and cost benefits of interventions for health.
vi. Develop and manage human resources and infrastructure for health research and ensure that

international collaborative research contributes to national health.

Prescription

1. Create a National Health Research System
2. Establish a National Health Research Management Forum
3. Operationalize a 10-point action program

National Health Research System (NHRS)

Health research system is a concept that integrates and coordinates the objectives, structures, stakeholders, processes, cultures and outcomes of health research towards development of equity in health and in national health system. It is a system for planning, coordinating monitoring and managing health research resources and activities and for promoting research for effective and equitable national health development. In order to enable the results of research to transform health as a major driving force for development.

Goals of the NHRS

- To generate and communicate knowledge that helps to form national health plan and guides its implementation, and thus contribute, directly or indirectly, to equitable health development in the country:
- To adapt and apply knowledge generated elsewhere to national health development; and
- To contribute to the global knowledge base on issues relevant to the country.

Underlying values

- Health Research as an investment
- Equity
- Ethics
- Self-reliance
- Ownership
- Solidarity
- Development of Research Culture
- Intersectorality
- Partnerships
- Originality
- Accountability

Functions of NHRS

1. Developing National Health Research Plan
2. Set priorities

Based on the following principles:

a. Responsiveness to following areas:
Current and emerging issues such as Demographic and Epidemiologic Transition emerging scientific developments such as Modern Biotechnology (Genomics, Human Genetics, New Drug Development, Stem Cell research), Health system research, Health Economics, Behavioral and social issues. Emerging and re-emerging infections etc. and the priorities of the National Health plan will guide the Research Agenda.

b. Integration
The integration of the National Research Plan with the priorities and aspiration of society is essential for the ready utilization of the results of research. The linkages of the health system with communities, District and State Governments and the Central government is essential for developing the data bases necessary for research and service priority setting and decision making. The generation of this data shall be a priority.

c. Multidisciplinarity and Linkages
Health Research in addition to the field of Health intersectorally encompasses Education, Environment, Ecology, Social and Behavioral Sciences, Population, Agriculture, Trade, Commerce in addition to the physical, chemical, biological and mathematical sciences. This multidisciplinarity will be reflected in the national health research plan.

d. Social and Behavioral Sciences and Health Economics
In order to make meaningful health policies, plans and programs and to make medical technology useful and accessible to the community, it is essential to understand the community's perception of health problems, health services and health care providers. Social and Behavioral sciences and Health Economics are integral to health research and will be actively fostered.

e. Focus on vulnerable and disadvantaged populations
Equity in services and development shall be the cardinal principle over riding the Health Research System. There shall be a special emphasis on vulnerable groups like scheduled castes, tribal populations, unorganized labour, women, children, adolescents, North East and the geriatric

populations who remain in the periphery of society and the larger health sector.

3. **Engage with Private Sector**
   The private sector, pharmaceuticals industry, biotechnology and biomedical technology oriented Industries, private educational institutions, hospitals and nursing homes, research foundations and institutions, private practitioners, NGO's and CBO's working on a not-for-profit basis etc. are now major stake stake holders in Health care research and delivery.
4. **Strengthen International Linkages**
   There are a large number of potential partners and in the choice of partners the priorities of the National Health Research Plan and national interest shall be paramount. Linkages with International Development partners and WHO and other UN Agencies shall be further developed and strengthened to ensure that India plays a legitimate role as an emerging economy.
5. **Ensure Ethical Research**
   The Bill on Research on Human Subjects and establishment of the National Biomedical Research Authority therein along with the guidelines developed by other agencies shall regulate all research. The Health Research System shall review these Guidelines from time to time, and harmonize them with International Guidelines. Facilitation of training in ethical research shall be the responsibility of the DHR. A major achievement has been the establishment of a National Clinical Trial Registry and all clinical trials are mandated to be registered by the DCGI.
6. **Ensure Targeted Financing**
   It shall endeavor to ensure that the allocation/ expenditure on health research is at least 20% of the allocation / expenditure on health.
7. **Monitor and Evaluate impact of health research**
   To ensure that resources are used efficiently and in line with agreed priorities there is a need for continuous monitoring and evaluation.
8. **Partnership with State health system**
   Encourage health research within States.
9. **Assess Health Research System**
   The following assessment criteria are proposed:
   - Robustness
   - Competence and Effectiveness
   - Credibility and Accountability
   - Ability to Champion the cause of health Research for Development
   - Ability to Generate Research Funding
   - Research Governance and Management
     A responsive and responsible governance and management structure needs to be developed in every research institution. This may be in the form of governing bodies or oversight bodies or auditing mechanisms.
   - Cost-effectiveness

   Stewardship, quality assurance, administrative and financial audit should be in place to ensure increased yields in research productivity and financing as well as in meeting the broader goals of health research for development and equity. Timeliness of conducting research should be ensured.

The NHRS shall be managed by a **National Health Research Management Forum (NHRMF).**

The National Health Research Management Forum (NHRFM)

National Health Research Management Forum is proposed having representation of all key stakeholders, the DHR as its Secretariat, and the following functions / terms of reference:

i) To advise on and evolve national health research policies and priorities and to evolve mechanisms and action plans for their implementation;
ii) To develop a 5 year projection of the plans for health research and to prepare an annual National health research plan;
iii) To de a mid-Plan appraisal for course correction as needed
iv) To promote the development of health research activities in the country;
v) To review biomedical and health research management, and suggest strategies to overcome problems in implementation of policies;
vi) To suggest mechanisms to nurture a scientific environment to attract talent and to develop human resources for biomedical and health research; and
vii) To facilitate utilization and dissemination of research results and advocacy for Health research.

The NHRMF will be Chaired by the Minister of Health & Family Welfare and Co-chaired by Minister of Science & Technology. The Secretariat of DHR shall be the Member-Secretary. DGHS and 8-10 eminent scientists/public health experts as well selected representatives from State Governments would be the other members.

Responsible of NHRMF

- **Stewardship**
- **Financing:** Resource generation, targeted allocation and judicious utilization.
- **Knowledge generation**
- **Utilization and Management of Knowledge**
- **Capacity Development:** Focused on both the quantity and quality of skills available / needed, including research techniques, research priority setting, research management, use of research ('demand' side), policy and systems analysis, communications, development of partnerships including medical colleges and rural health research centers.

The 10-point Action Program

The is a fundamental right of all people. An evidence base developed by approaches research should be the basis of Health Systems and Services.

1. Harmonize optimally National policies in a variety of areas (education, social sciences, population, agriculture, nutrition, science, etc) to facilitate intersectoral collaboration and partnership, so that maximum development returns can occur from health research.
2. Ensure true inter-sectorality of health research and harness the resources in areas such as social sciences, economics and traditional systems of medicine.
3. Facilitate priority setting to guide the direction of health research and prepare Five-year Plan and strategy documents.
4. Encourage the development of fundamental and basic research in areas relevant to health to ensure that a national critical mass of scientists who can contribute the benefits of modern technology to health research is created.
5. Foster translational research to ensure that the products of basic research can be appropriately utilized in health systems and services.
6. Establish linkages between health research and national health programmes to identify key operational issues and facilities the operationalisation of evidence based programmes and to obtain feedback for the optimization of health research
7. Build and integrate capacity for research in National Health Programs, research institutions and in the private sector (profit and non-profit organizations) both in rural and urban research settings utilizing as far as possible areas of excellence already available in the country.
8. Ensure that the global knowledge base is available for national progammes, and that research is channeled in relevant directions without unnecessary duplication by the optimal communication and networking technology.
9. Manage global resources and transnational collaborations optimally to ensure that collaborative health systems and services.
10. Generate the evidence-base for health systems and services, to be significant promotes of equity and contribute to national development so that health research becomes a poverty reduction tool.

Constraints and Concerns

The potential of Indian researchers has been suppressed by various constraints that need to be identified order to give the necessary impetus to enable health research to be a vehicle for national Development. These constraints and concerns are as follows:

- Low priority to health research given by Policy makers particularly politicians and bureaucrats. In fact important current health programs like the National Immunization days and DOTS, while they were the result of Indian health research were only implemented when they were given the seal of International acceptance.
- The crucial role of health research has not been recognized by Ministry of Health & family Welfare.
- There is no National plan or consensus on priorities on health research.
- A 'research culture' and a climate that fosters health research are not present.
- Capacity development, for Human resources and Infrastructure is not recognized as a priority.

- The medical educational system does not foster a research culture. The glamour of curative care often works as the career guiding principle of medical students.
- A clear research career structure and productivity related incentives are not in place.
- Intersectoral linkages are weak for coordinated action.
- The tools of modern information technology and biotechnology are relatively inaccessible to the majority of health professionals and researchers.
- The links between health research and health services and programs are weak and ill defined and need to be focussed.

References

Govt. of India. National Health Research Policy 2011. ICMR, Ministry of Health & Family Welfare, GOI, New Delhi.

Kishore J, Ray PC. Priority in Biochemical Research. Indian Nursing Year Book 2000-2002, The Trained Nurse's Association of India, New Delhi.

CHAPTER 55

PHARMACEUTICAL POLICY

The government announced the 'Pharmaceutical policy 2002' in February 2002. The salient features are:

1. Industrial licensing for all bulk drugs cleared by Drug Controller General (India), all their intermediates and formulations will be abolished, subject to stipulations laid down from time to time in the industrial Policy:
   - bulk drugs produced by the use of recombinant DNA technology,
   - bulk drugs requiring in-vivo use of nuclei acid as the active principles, and
   - specific cell/tissue targeted formulation
2. Foreign investment up to 100% will be permitted subject to the clearance from Drug Control General (India).
3. Automatic approval for Foreign Technology Agreements will be available in the case of all bulk drugs cleared by Drug Controller General (India).
4. Measures to give impetus to R &D in the Drug Sector are as follow:
   - In principles approval to the establishment of the pharmaceutical Research and Development Support Fund under the administrative control of the Department of science and technology;
   - A manufacturer producing a new drug patented under the Indian Patent Act 1970, if developed or processed or involving new delivery system through indigenous R & D would be eligible for exemption from price control in respect of that drug till the expiry of the patent from the date of the commencement of its commercial production in the country by the new patented process;
5. The 279 items appearing in the alphabetical list of Essential Drugs in the National Essential Drug List 1996 of the Ministry of Health and Family Welfare and the 173 items, which are considered important by that Ministry from the point of view of their use in various health programs, in emergency care, etc., with the exclusion, as in the past, therefrom of sera and vaccines, blood products, combinations., would form the total basket out of which selection of bulk drugs would be made be made for price regulation;
6. Ceiling price may be fixed for any formulation and it would be obligatory for all;
7. An independent body, National Pharmaceutical Pricing Authority has been entrusted with the task of price-fixation/revision;
8. Government would keep a close watch on the prices of medicines;
9. The provision of limiting, profitability, as per

COMMENTS

Price of the drugs need to be control because in India, medicines constitute 40-50% of the cost of treatment, whereas in the west, it is about 10%. About 30% of the hospitalized patients mortgage or sell their assets,

and 35% are pushed below the poverty line due to hospitalization. Drug traders earn huge margins. Trade margin for six antibacterial, antitubercular and anti-acidity drugs ranged from 296% to 1531%. Surprisingly, the policy aims at reducing the number of price controlled drugs from 76 to five, when this number had already been reduced from 347 in 1979 to 142 in 1987 to 76 in 1995. The Drug Price Control Order in 1995 has made the most important drugs out of price control such as painkillers, antianemic drugs, drugs in the treatment of epilepsy, elephantiasis, heart diseases, cancer, AIDS, vaccines and sera to prevent and treat dangerous infections, and some of the essential drugs.

In a survey it was found that around 29 per cent of chemist sales in India are performed without any prescription. The survey also reveals that 42 per cent of chemists in India are concentrated in the top nine most populated cities and 37 per cent of chemist outlets are attached to doctor clinics, polyclinics, hospital facilities and nursing homes. The census covered 120 cities (metro and non-metro) and includes insights into over 3.73 lakh doctors and 99,000 chemists across multiple parameters (IMS 2013). Sales on counter without prescription has been linked with serious hazards and need to be controlled.

References

Govt. of India. India 2005. Ministry of Information and Broadcasting, Publication Division 2005.

IMS. 29% of chemist sales in India performed without prescription: Survey. http://www.aalatimes.com/2013/08/02

Phadke A. Price Pangs. TOI 2004; 1st December.

CHAPTER 56

NATIONAL POLICY ON INDIAN SYSTEMS OF MEDICINE & HOMOEOPATHY, 2002

Objectives:

(a) To promote good health and expand the outreach of health care to our people, particularly those not provided with health cover, through preventive, promotive and curative interventions through ISM&H.

(b) To improve the quality of teachers and clinicians by revising curricula to contemporary relevance by creating model institutions Centers of Excellence and extending assistance for creating infrastructural facilities.

(c) To ensure affordable ISM&H services and drugs which are safe and efficacious.

(d) To facilitate availability of raw drugs which are authentic and contain essential components as required under pharmacopial standards to help improve quality of drugs, for domestic consumption and export.

(e) To integrate ISM&H in the health care delivery system and National Programs and ensure optimal use of the infrastructure of hospitals, dispensaries and physicians.

(f) To re-orient and prioritize research in ISM&H to gradually validate therapy and drugs to address in particular the chronic and new life style related emerging disease.

(g) To create awareness about the strengths of these systems in India and abroad and sensitize other stakeholders and providers of health.

(h) To provide full opportunity for the growth and development of these systems and utilization of their potential, strength and revival of their glory.

Strategies

(a) Legislative measures would be taken to check mushroom growth of substandard colleges.

(b) Course curricula would be reinforced to raise the standards of medical training and to equip trainees for utilization in national health program.

(c) Priority would be accorded to research covering clinical trials, pharmacology, toxicology, standardization and study of pharmaco-kinetics in respect of already identified areas of strength.

(d) The medicinal plants Board would address all issues connected with conservation and sustainable use of medicinal plants leading to remunerative farming, regulation of medicinal farms and conservation of biodiversity

(e) Medicinal plants Board would acquire statutory status to be able to regulate registration of farmers and cooperative societies, transportation, marketing of medicinal plants and proper procurement and supply of pharmaceutical industry.

(f) Protection of India's traditional medicinal knowledge would be undertaken through a progressive creation of a Digital Library for each system and eventually for codified knowledge

leading to innovation and good health outcomes.

(g) Efforts would be made integrate and mainstream ISM&H in health care delivery system and in National Programs.

(h) Allopathic hospitals would be encouraged to set up AYUSH health facilities.

(i) Central Government would assist allopathic hospitals to establish Panchkarma and Ksharshutra facilities for the treatment of neurological disorders, musculo-skeletal problems as well as ambulatory treatment of fistula-in-ano, bronchial asthma and dermatological problems.

(j) States would be encouraged to consolidate the ISM&H infrastructure and health services.

(k) Pharmacopoeial work related to Ayurveda, Unani, Siddha and Homoeopathy Drugs Would be expedited.

(l) Industry would be encouraged to set up on regional basis to standardize the in-process quality control of ISM products and to modernize traditional processes without changing the concepts of ISM.

(m) Operational use of ISM in Reproductive & Child Health (RCH) would be encouraged in eleven identified areas, where the Indian system of medicine would be useful for antenatal, intra-natal, post-natal and neonatal care.

(n) Keeping in view the global interest in understanding ISM concepts and practices, modules will be formulated for introducing Ayurveda and Yoga to medical schools and institutional abroad and to expose medical graduates.

(o) Awareness program on the utility and effectiveness of ISM&H would be launched through the electronic and print media.

(p) To address domestic as well as global concerns relating to presence of heavy metals in Ayurveda, Siddha and Unani formulations, the Department of AYUSH has initiated a research project under are Golden Tribgle project in collaboration with the Central Council for Research in Ayurveda and Siddha (CCRAS), council of Scientific and Industrial Research (CSIR) and Indian Council of medical Research (ICMR) for phusicochemical characterization and safety study of eight most widely used Bhasmas (Herbo-metallic compounds) prepared in accordance with the classical texts.

(q) In the plan an ambitious plan has been drawn up by the National Medicinal Plants board for the provision of marketing and value added services to the growers through States Medicinal Plant Boards and Herbal Mandis.

(r) With a view protecting India's traditional medicinal Knowledge Digital Library (TKDL) has been created in five international languages for providing access to International Patent

(s) National Institute of Siddha, Chennai and National Institute of Unani Medicine Bangalore, have been established in the 10th plan

(t) The Department is actively pursuing the proposal for establishment of an All India Institute of Ayurveda at Sarita Vihar, New Delhi.

CHAPTER 57

NATIONAL POLICY ON EDUCATION

INTRODUCTION

World

Some 135 million children between the ages of 7 ages of 7 and 18 in the developing world have never been to school (Gordon 2003). Globally, over 100 million children aged 6-12 are not enrolled in primary school, while 137 million young people will begin their adult lives lacking the basic tools of literacy and numeracy (UNISCO 2004). The burden of illiteracy, like the burden of disease, falls overwhelmingly on these who are female, poor and rural.

Education improves health outcomes for two main reasons. It provides some protection from such shocks as ill health and disability, price and credit swings, and natural and environmental disasters by enabling more secure employment, higher incomes, the better access to economic assets and credit. Even among those with similar incomes, the educated are generally healthier than the uneducated because:

- Education equips them to understand, evaluate and apply facts;
- It increases the ability to acquire and use health –related information and services (World Bank 1993, WHO 2003);
- It gives greater bargaining power in household decisions and personal relationships –particularly important for woman, as it often translates into increased allocation of household resources to child health, schooling and nutrition (Thomas 1990, Herz and Sperling 2004); and
- It increases social status.

Child and maternal mortality: Each extra year of material education in the developing world reduces under-five child mortality by 5-10% (UNICEF 2004). Woman's educational attainment explained more then 80% of the decline in infant from 1983-1999 in five Indian states (Bhalla et al. 2003). Every additional year of education will prevent two maternal deaths in every 1000 woman. Education also improves maternal health by increasing knowledge about health-care practices and the use of health services during pregnancy and birth; improving nutrition; and increasing birth spacing. Female education is probably the strongest instrument we have for reducing infant mortality and child malnutrition' (Smith and Haddad 1999). Educated women are more likely to make use of health services, including those that effectively prevent childhood disease (Sandiford et al. 1995). Globally, educated mothers are about 50% more likely to immunize their children than are uneducated mothers (Herz and Sperling 2004). They tend to be able to exercise autonomy in personal and sexual relationships, which allows them to delay first sexual activity marry later, begin childbearing later, have fewer children, and resist practices such as female genital cutting, domestic violence and early marriage for their own daughters (Jejeebhoy 1998 Sen 1999, Herz and Sperling 2004). Doubling the proportion of women with a secondary education would reduce average fertility rates from 5.3 to 3.9 children per women (Subbarao and Raney 1995).

The impact of health on education: ill health also has a significant negative impact on education outcomes. Disease such as malaria, tuberculosis, and HIV/AIDS keep millions of children –and teachers- away from the classroom temporarily or permanently. Infection and malnutrition impairs their concentration and can diminish cognitive abilities in the long term. A school-based health and nutrition program that provided deworming, micronutrient supplementation, latrines and clean water, and health education resulted in a 20% increase in school attendance in Burkina Faso, as well as significant improvement in pupil health (UNESCO 2004).

MDG on Gender parity that to be achieved by 2005 has already failed and earned a shameful place in history as the world has missed the first of targets. South Asia remains the most educationally unequal region in the world; women average only about half as many year of education as men, and female secondary level enrolment rates are only tow third of kale rates. Universal primary completion is progressing very slowly.

India

Literacy has been associated with health and family welfare. That is why literacy is always concern to health planners. Increasing level of literacy is also correlated with decreasing rates in infant mortality, maternal mortality and birth. The goal of universal elementary education which was envisaged in the Constitution of India to be achieved by 1960 still remain a distant dream despite the fact that education, especially elementary education, occupies a central space in the role model of development. The 83rd Amendment to the Constitution, which made elementary education fundamental right of every child, was expected to have far reaching spin-off, but the picture is far from bright. Literacy rate was 18.3% in 1951 and reached to 65.4% in 2001. Gross enrolment from 32.1% to 82.4% in the same duration but pupil teacher ratio has become worst from 1:24 in 1951 to 1:42 in 2001.

GOAL

Universal enrolment, retention, minimum level of learning, reduction of disparities ad universalization of effective access of schooling.

OBJECTIVES

- Universal enrolment of all children including girls, using both full time formal schools and part time non-formal arrangements.
- Reduction of dropout rate between class I to V and I to VIII from the existing 45% and 60% to 20% and 40% respectively.
- Achievement of minimum level of learning by approximately all children at the primary level and introduction of this concept at the upper primary state on large scale.
- Reduction in disparities by emphasis on girl's education and special measures for children belonging to SC/ST.
- Expansion of early childhood development activities including appropriate low cost family and community based interventions.
- Universalization of effective access to schooling.

POLICY

National Policy on Education (NPE), 1986 and updated in 1992, is a milestone in Indian Education. The Priority areas in this policy are: 1. Universalizing Elementary Education, 2. Adult literacy, and 3. Education for women's equality. The Policy advocates a 'dual track' approach, aimed at simultaneous promotion of adult literacy and primary education, with a pronounced focus on girl, and disadvantaged groups.

Several states have already come up with their own Plan of Actions and many states have been associated in the formulation and implementation of national Programs such as *Total Literacy Campaigns*, *Operation Blackboard*, teacher education and the new Direct Primary Education Program. The National Policy on Education aimed at free and compulsory education of satisfactory quality for all children up to 14 years of age before the commencement of the twenty-first century.

Strategy

1. The focus is shifted from educationally backward states to educationally backward districts and from sectoral to a multi-sectoral approach with convergence between all development inputs.
2. Increase reliance on social mobilization to promote basic education, and
3. Integration of adult literacy and non-formal Programs with vital themes such as small family

norms, health care, environment and nutrition.

4. Village Education Committee formation for better management and ensuring full participation of all children and parents.
5. Setting up of District Boards of Education and District Institutes of Education and Training (DIETs).
6. Involvement of NGOs to strengthen village Education committee and capacity building at the local levels.
7. An effective MIS will be created to provide information required for decision making, planning and management to the district levels and information for monitoring district plans of the state and national levels.
8. The opening of new primary schools according to norms in the unserved habitation, and provision of non-formal education programs for small habitations and for children who cannot benefit from the school system.
9. In order to increase enrolment at the upper primary stage, the infrastructure at the upper primary state will be expanded.
10. The existing norms of providing an upper primary school within 3 km walking distance, for all practical purposes, denies education at this level to a large section of girls. This norms will be relaxed and the existing ratio between primary and upper primary schools will be improved to 1:2.
11. Provision will be made to add additional rooms and provide additional teachers to existing schools through the scheme of operation blackboard and the existing norm for the minimum -2 classrooms and 2 teachers will be raised successfully.
12. Non-formal education will be developed as a complementary system to the formal education system, such that there will be parallel administrative apparatus for non-formal education; greater attention to the interests of the learner, and its quality will be comparable with formal system and conform to the MLLs laid down for the primary stage.
13. Mechanisms will be developed for entry from non-formal to formal and vice versa.
14. Regular in-service training of teachers for their capacities and skills.
15. State level Councils of Educational Research and Training will be restructured so that they become institutions principally for resource support to elementary education, non-formal education and early childhood education.
16. Development of Monitoring system for enrolment, retention, completion, and achievement.

COMMENTS

In spite of the Constitutional direction to state to educate all children up to 14 years free of cost the many states are still far from achievement of this goal. It is observed in Orissa that 10,000 of the 40,000 schools are without buildings and 3000 schools are single room with just one teacher. 55% should do not have drinking water facilities and 40% of the classrooms are without blackboards (HT 2003 27th Nov). Even in schools of Delhi the situation is not very good.

References

Bhalla S, Saigal S Basu N. *Girls' education is it – nothing else matters (much).* New Delhi, Oxus Research & Investments (Background paper for World Development Report 2003/04) 2003.

Government of India. India 2005. Ministry of Information and Broadcasting, New Delhi.

Gupta JP, Sood AK. Comtemporary Public Health. New Delhi : Apothecaries Foundation 2005.

Jejeebhoy S. Wife-beating in rural India: a husband's right? Evidence from survey data Economic and Political Weekly 1998; 23 (15): 855-62.

Sandiford P et al. The impact of women's literacy on child health and its interaction with access to health services. *Population Studies* 1995; 49:5-17.

Sen P. Enhancing women's choices in responding to domestic violence in Calsutt: a comparison of employment and education. European Journal of Development Research 1999; 11 (2): 65-86.

Simth L, Haddad L. *Explaining child Malnutrition in Developing Countries.* Washing DC, International Food policy Research Institute (Research Report No.111) 1999.

Subbarao K, Raney L. Social gains from female education. Economic Development and Cultural Change 1995; 44 (1): 105-28.

UNICEF. *States of the world's Children Report.* New York (http://www.unicef.org/sowco4/, accessed 18 February 2005).

CHAPTER 58

NATIONAL WATER POLICY 2002

Need of a Water Policy

- It is a gross misconception that India is a water-rich country and water is a cost-free commodity. According to number of studies conducted in India and abroad, India's per capita water availability status is likely to move from "marginally vulnerable" (as in 1990) down to "*water scarcity*" in the year 2025. In fact, India is likely to experience "*water-stress*" from the year 2007 onwards.
- Water is a prime natural resource, a basic human need and a precious national asset. Water, as a resource is one and indivisible: rainfall, river waters, surface ponds and lakes and ground water are all part of one system. Surface and ground water is the only sources, which can be used for human consumption, which is only less than 1% of the total water available on Earth.
- An estimated one-third of the world's population will suffer from chronic water shortage by the year 2025 due to increasing demand for drinking water caused by growing population, decreasing quality of the water resulting from pollution, and augmenting requirements of expanding industries and agriculture.
- Similarly, 80% of all diseases in developing countries, including India are related with unsafe drinking water and poor sanitation.
- Realizing the importance and scarcity attached to the fresh water, it has to be treated as an essential environment for sustaining all life forms. Water is a scarce and precious national resource to be planned, developed, conserved and managed as such, and on an integrated and environmentally sound basis, keeping in view the socioeconomic aspects and needs of the States. It is one of the most crucial elements in developmental planning.
- Globally, the number of major disasters per year related to water (Flood, droughts) has doubled in the last decade from 200 to 400, and economic losses increased 10 fold. Floods and droughts affect vast areas of the country, transcending state boundaries. One-sixth area of the country is drought-prone.
- Rampant and indiscriminate use of pesticide is turning vast amount of fresh water unusable. The development, and over-exploitation of groundwater resources in certain parts of the country have raised the concern and need for judicious and scientific resource management and conservation.
- Growth process and the expansion of economic activities inevitably lead to increasing demands for water for diverse purposes: domestic, industrial, agricultural, hydropower, thermal-power, navigation, recreation, etc. So far, the major consumptive use of water has been for irrigation, which has increased many folds. The country's population, which is over 1027 million (2001 AD) at present, is expected to reach a level of around 1390 million by 2025 AD need more water.

- Science and technology and training have to play important roles in water resources development and management in general particularly to eliminate the pollution of surface and ground water resources, to improve water quality.

National Water Policy was adopted in September, 1987. Since then, a number of issues and challenges have emerged in the development and management of the water resources. Therefore, the National Water Policy (1987) has been reviewed and updated.

Information System

A well developed information system, for water related data in its entirety, at the national / state level, is a prime requisite for resource planning.

Water Resources Planning

Non-conventional methods for utilization of water such as through inter-basin transfers, artificial recharge of ground water and desalination of brackish or sea water as well as traditional water conservation practices like rainwater harvesting, including rooftop rainwater harvesting, need to be practiced to further increase the utilizable water resources. Efforts shall be to conserve the water in the catchment.

Institutional Mechanism

For the multisectoral, multidisciplinary and participatory approach as well as integrating quality, quantity and the environmental aspects, the existing institutions at various levels will have to be reoriented or reorganized. Appropriate river basin organizations should be established.

Water Allocation Priorities

Allocation priorities should be broadly as follows: Drinking water; Irrigation; Hydropower; Ecology; Agro-industries and nonagricultural industries; Navigation and other uses.

Project Planning

The study of the likely impact of a project during construction and later on human lives, settlements, occupations, socioeconomic, environment and other aspects shall form an essential component of project planning. The adverse impact should be minimized and should be offset by adequate compensatory measures. The project should be sustainable.

Ground Water Development

There should be a periodical reassessment of the ground water potential on a scientific basis, taking into consideration the quality of the water available and economic viability of its extraction.

Drinking Water

Adequate safe drinking water facilities should be provided to the entire population both in urban and in rural areas. Drinking water needs of human beings and animals should be the first charge on any available water.

Irrigation

Irrigation planning either in an individual project or in a basin as a whole should take into account the irrigability of land, cost-effective irrigation options possible from all available sources of water and appropriate irrigation techniques for optimizing water use efficiency. There should be a close integration of water-use and land-use policies.

Resettlement and Rehabilitation

Optimal use of water resources necessitates construction of storages and the consequent resettlement and rehabilitation of population.

Financial and Physical Sustainability

Adequate emphasis needs to be given to the physical and financial sustainability of existing facilities. A need to ensure that the water charges for various uses should be fixed in such a way that they cover at least the operation and maintenance charges of providing the service initially and a part of the capital costs subsequently. These rates should be linked directly to the quality of service provided.

Participatory Approach to Water Resources Management

Water Users' Associations and the local bodies such as municipalities and *gram panchayats* should particularly be involved in the operation, maintenance and management of water infrastructures / facilities.

Private Sector Participation

Private sector participation should be encouraged in planning, development and management of water resources projects for diverse uses, wherever feasible.

Water Quality
Both surface water and ground water should be regularly monitored for quality. A phased program should be undertaken for improvements in water quality. Effluents should be treated to acceptable levels and standards before discharging them into natural streams. Principle of 'polluter pays' should be followed in management of polluted water.

Water Zoning
There should be a water zoning of the country and the economic activities should be guided and regulated in accordance with such zoning.

Conservation of Water
Conservation consciousness should be promoted through education, regulation, incentives and disincentives. The resources should be conserved and the availability augmented by maximizing retention, eliminating pollution and minimizing losses.

Flood Control and Management
There should be a master plan for flood control and management for each flood prone basin. Increased emphasis should be laid on non-structural measures such as flood forecasting and warning, flood plain zoning and flood proofing for the minimization of losses and to reduce the recurring expenditure on flood relief. There should be strict regulation of settlements and economic activity in the flood plain zones along with flood proofing, to minimize the loss of life and property on account of floods.

Land Erosion by Sea or River
The erosion of land, whether by the sea in coastal areas or by river waters inland, should be minimized by suitable cost-effective measures.

Drought-prone Area Development
Drought-prone areas should be made less vulnerable to drought-associated problems through soil-moisture conservation measures, water harvesting practices, minimization of evaporation losses, pastures, forestry, development of the ground water potential including recharging and the transfer of surface water from surplus areas where feasible and appropriate.

Monitoring of Projects
There should be a system to monitor and evaluate the performance and socioeconomic impact of the project.

Water Sharing / Distribution amongst the States
Taking into account of water resources availability necessary guidelines need to be evolved for facilitating future agreements amongst the basin states. The Inter-State Water Disputes Act of 1956 may be suitably reviewed and amended for timely adjudication of water disputes referred to the Tribunal.

Performance Improvement
There is an urgent need of paradigm shift. Instead of expansion and creating water resources, there is now a need to give greater emphasis on the improvement of the performance of the existing water resources facilities.

Maintenance and Modernization
There should be a regular monitoring of structures and systems and necessary rehabilitation and modernization programs should be undertaken.

Safety of Structures
There should be proper organizational arrangements at the national and state levels for ensuring the safety of storage dams and other water-related structures consisting of specialists in investigation, design, construction, hydrology, geology, etc.

Science and Technology
Intensifying research efforts in various areas, including the following are needed: snow and lake hydrology; surface and ground water hydrology; assessment of water resources; water harvesting and ground water recharge; water quality; water conservation; recycling and reuse; better water management practices and improvements in operational technology; the safety and longevity of water-related structures; risk analysis and disaster management; use of sea water resources; prevention of salinity ingress; environmental impact etc.

Training
The training should extend to all the categories of personnel involved in these activities as also the farmers.

COMMENTS
To meet the entire world's needs for clean water and sanitation would cost an estimated additional $ 9 billion per year, well under the $ 12 billion spent per year on

perfumes, and $ 18 billion on pet foods by European and North America. The world spends more than 80 times that figure on the military and armaments.

In spite of the launching of the 'Ganga Action Plan' and the 'National River Action Plan', India faces a major problem of diarrhoeal diseases. Lack of safe water supply, poor environmental sanitation, improper disposal of human excreta and poor personal hygiene help to perpetuate and spread diarrhoeal diseases in India. Since diarrhoeal diseases are caused by 20-25 pathogens, vaccination, though an attractive disease prevention strategy, is not feasible. However, as the majority of childhood diarrhoeas are caused by V. cholerae, Shigellae dysenteriae type 1, rotavirus and enterotoxigenic Escherichia coli (E. coli) which have a high morbidity and mortality, vaccines against these organisms are essential for the control of epidemics. A strong political will with appropriate budgetary allocation is essential for the control of childhood diarrhoeal diseases in India, a formidable task in a country with a population of over 1 billion.

References

Bhattacharya SK Progress in the prevention and control of diarrhoeal diseases since Independence. Natl Med J India. 2003;16 Suppl 2:15-9.

Govt. of India. National Water Policy. Central Water Commission, GOI, New Delhi.

CHAPTER 59

NATIONAL ENVIRONMENT POLICY 2006

POLICY

A need to reformulate a comprehensive policy for the management of environment has been realized due to development of new challenges. The National Environment Policy 2004 (draft) contained previously announced policies related to management of environment namely the National Forest Policy, 1988, the National Conservation Strategy and Policy Statement on Environment and Development, 1992; and a Policy Statement on Abatement of Pollution, 1992, National Water Policy, 2002.

This is also a response to our national commitment to a clean environment, mandated in the Constitution in Articles 48 A and 51 A (g), strengthened by judicial interpretation of Article 21. It is recognized that maintaining a healthy environment is not the state's responsibility alone, but also that of every citizen. In the Policy "environment is the one that comprises all entities, natural or man-made, external to oneself, which provide value, now or perhaps in the future, to humankind. Environmental concerns relate to their degradation through actions of humans".

Key Environmental Challenges: Causes and Impacts

- Institutional failures, resulting in lack of clarity or enforcement of rights of access and use of environmental resources, discouragement for environmental conservation, market failures, and governance constraints.
- Poverty itself can accentuate environmental degradation. Poor exploits resource for production and consumption, for example water for agricultural, fuel-wood for cooking, intensive fisheries, etc.
- Economic growth on the one hand, may result in "excessive" environmental degradation through use of natural resources and generation of pollution aggravated by institutional failures. On the other hand, it permits improvement in environmental quality by making available the necessary resources for environmental investments and generating societal pressures for improved environmental behavior and institutional and policy change.
- Institutional failures, resulting in lack of clarity or enforcement of rights of access and use of environmental resources, discouragement for environmental conservation, market failures, and governance constraints.
- Environmental factors are estimated as being responsible in some cases for nearly 20 percent of the burden of disease in India (Hughes et. al. 2001). A number of environment-health factors are closely linked with dimensions of poverty (e.g. malnutrition, diarrheal diseases) and it has been established that interventions targeted at environmental management – e.g. reducing indoor air pollution, protecting sources of safe drinking water, sanitation measures, improved public health governance – offer tremendous opportunities in

reducing the incidence of a number of critical health problems.

- Emerging global environmental concerns such as climate change, stratospheric ozone depletion, and biodiversity loss are major challenges.

Objectives

1. Conservation of Critical Environmental Resources;
2. Intra-generational Equity: Livelihood Security for the Poor: ensuring equitable access to environmental resources and quality for all sections of society;
3. Inter-generational Equity: meeting the needs and aspirations of present and future generations;
4. Integration of Environmental Concerns in Economic and Social Development;
5. Efficiency in Environmental Resource Use;
6. Environmental Governance (good governance with transparency, rationality, accountability, reduction in time and costs, and participation) to the management and regulation of use of environmental resources); and
7. Enhancement of Resources for Environmental Conservation;

Principles

The following principles are considered as guide to carry out the activities of different actors in relation to this policy:

1. **Human beings are at the Center of Sustainable Development Concerns.**
2. **The Right to Development.**
3. **Environmental protection is an integral part of the development process.**
4. **The Precautionary Approach.**
5. **Economic Efficiency:** refers to the maximization of welfare across all members of a society, given its human, natural, and man-made resources, its technology, and the preferences of its members. Further implications of this principle are as follows:

a) **"Polluter Pays":** The polluter should, in principle, bear the cost of pollution, with due regard to the public interest and without distorting international trade and investment.

b) **Cost Minimization**: Efficiency of resource use may also be accomplished by the use of policy instruments that create incentives to minimize wasteful use and consumption of natural resources. The principle of efficiency also applies to issues of environmental governance by streamlining processes and procedures in order to minimize costs and delays.

6. **Entities with *"Incomparable"* Values:** Significant risks to human health, life, and environmental life-support systems, besides certain other valuable and unique natural and man-made entities, which may not be conceived in economic terms, shall be considered as "Incomparable" and need to be prioritize in allocation of resource for their conservation and protection. A conventional economic cost-benefit calculus would not apply in this case.
7. **Equity:** The cardinal principle of equity or justice requires that human beings cannot be treated differently based on color, caste, race, religion, or socioeconomic status. "Intra-generational equity" is related to justice within societies and in particular providing space for the participation of underprivileged men and women, and "inter-generational equity" is related to justice between generations.
8. **Legal Liability:** Civil liability for environmental damage would deter environmentally harmful actions, and compensate the victims of environmental damage. The following alternative approaches to legal liability may apply:
   a) **Fault based liability:** In this regime a party is held liable if it breaches a preexisting legal duty, for example, an environmental standard.
   b) **Strict liability:** it imposes an obligation to compensate the victim for harm resulting from actions or failure to take action, which may not necessarily constitute a breach of any law or duty of care.
9. **Public Trust Doctrine:** The State is not an absolute owner, but merely a trustee of all natural resources, which are by nature meant for public use and enjoyment, subject to reasonable conditions, necessary to protect the legitimate interest of a large number of people, or nation.
10. **Decentralization:** It involves ceding or transfer of power from a Central Authority to State and Local Authorities, in order to empower public authorities.
11. **Integration:** It refers to the inclusion of environmental considerations in all sectoral policymaking, economic, social and natural sciences.

12. **Environmental Standard Setting:** It needs consideration of type of society or area, risks to human health, risks to other environmental entities, technical feasibility, costs of compliance, and strategic considerations.
13. **Preventive Action:** It is better than attempting to restore degraded environmental resources after the fact.
14. **Environmental Offsetting:** It is an obligation to protect threatened or endangered species and natural systems that are of special importance to sustaining life, providing livelihoods, or general well-being.

Strategies and Actions

The following strategic themes and actions to be taken but these are not complete list:

1. **Regulatory Reforms**

   Revisiting the Legislative Framework: The present legislative framework is broadly contained in the umbrella Environment Protection Act 1986, the Water (Prevention and Control of Pollution) Act, 1974, the Water Cess Act 1977 and the Air (Prevention and Control of Pollution) Act, 1981. The law in respect of management of forests and biodiversity is contained in the Indian Forest Act 1927, the Forest (Conservation) Act 1980, the Wild Life (Protection) Act 1972 and the Biodiversity Act 2003 and all need to be revised according to the NEP 2004.

2. **Process related reforms**

   Approach would be decentralized with ensuring greater transparency and accountability. A judicious mix of civil and criminal processes would be reviewed.

3. **Substantive Reforms**

   (i) **Environment and Forests clearances:** Clearance processes would be made more effective and prohibiting encroachment on forests.

   (ii) **Coastal Areas:** Development activities in the coastal areas are regulated by means of the Coastal Regulation Zone notifications and Integrated Coastal Zone Management (ICZM)

   (iii) **Living Modified Organisms (LMOs):** Biotechnology has an immense potential to enhance livelihoods and contribute to the economic development of the country. On the other hand, LMOs may pose significant risks to ecological resources, and perhaps, human and animal health and need to be regulated.

   (iv) **Environmentally Sensitive Zones:** Identify and give legal status to Environmentally Sensitive Zones in the country. Formulate area development plans for these zones on a scientific basis, with adequate participation by the local communities and create local institutions with adequate participation.

   (v) **Monitoring and Enforcement:** Give greater legal standing to local community based organizations to undertake monitoring of environmental compliance, and report violations to the concerned enforcement authorities and develop feasible models of public-private partnerships.

   (vi) **Use of economic principles in environmental decision-making:** There is a need to reverse the tendency to treat resources as "free goods" and to pass the costs of degradation to other sections of society, or to future generations of the country. The environmental costs and benefits associated with various activities, including sectoral policies, should be evaluated and incorporated in decision-making.

Enhancing and Conserving Environmental Resources

Apart from programmatic approaches, review and reform of regimes to account for their environmental consequences is essential. In addition, there is lack of awareness of the causes and effects of environmental degradation, and how they may be prevented, among both specialized practitioners of the relevant professions, including policymakers, as well as the general public, which needs to be redressed.

Land Degradation

The degradation of land is due to following reasons: soil erosion, alkali-salinization, water logging, pollution, reduction in organic matter content include loss of forest and tree cover, excessive use of irrigation, improper use of agricultural chemicals, diversion of animal wastes for domestic fuel, and disposal of industrial and domestic wastes on productive land besides subsidies for water, power, fertilizer and pesticides, and absence of conducive policies and

regulatory systems. Following specific initiatives would be taken: a) Adoption of science-based, and traditional sustainable land use practices, farmer's training; b) Promote reclamation of wasteland and degraded forestland through multistakeholder partnerships; c) Prepare and implement thematic action plans for arresting and reversing desertification.

Desert Ecosystem

The arid and semi-arid region of India covers 38.8% of India's geographical area and spreads over 10 states. The Indian desert fauna is extremely rich in species diversity of mammals and winter migratory birds. However, due to population growth and urbanization these natural resources are at risk of destruction. The needed measures include:

a) Intensive water and moisture conservation through practices based on traditional and science based knowledge, and relying on traditional infrastructure.
b) Enhancing and expanding green cover based on local species.
c) Reviewing the agronomic practices in these areas, and promoting agricultural practices and varieties, which are well adapted to the desert ecosystem.

Capacity Building

The following actions are necessary:

a) Review the present institutional capacities at the Central and State levels, in respect of enforcement of environmental laws and regulations. Prepare and implement suitable programs for enhancement of the capacities, as required.
b) Incorporate in all environmental programs a capacity development component, with sufficient earmarked funds.
c) Ensure continuous upgradation of knowledge and skills of the scientific and technical personnel involved in environmental management in public institutions at all levels: Central, State, and Local, through dedicated capacity building programs.

Research and Development

Key areas of research are taxonomies of living natural resources; research leading to better understanding of ecological processes and pathway; able to provide direct inputs to policy making and development of technologies for environmental management and clean production. The following actions would be taken:

a) Periodically identify and prioritize areas for research.
b) Establish a research program in priority areas within the Government, with expected outputs clearly specified.
c) Encourage research in priority areas outside the Government, with necessary financial and institutional support.

International Cooperation

India has participated in major international events on the environment, since 1972. The country has contributed to, and ratified several key multilateral agreements on environmental issues in recognition of the transboundary nature of several environmental problems, and has complied with its commitments. The following steps would be taken: a) Avail of multilateral and bilateral cooperation programs, for capacity building for environmental management, particularly in relation to commitments under multilateral instruments; b) Participate in mechanisms and arrangements under multilateral agreements for enhancing flows of resources for sustainable development; c) Provide assistance to other developing countries, in particular for scientific and technical capacity building for environmental management.

Forests and Wildlife

(i) Forests: The National Forest Policy, 1988, and the Indian Forest Act, as well as the regulations under it, provide a comprehensive basis for forest conservation. However, it is necessary, looking to some of the underlying causes of forest loss, to take some further steps.

(ii) Wildlife: Expand the Protected Area (PA) network of the country, including Conservation and Community Reserves; Paralleling multistakeholder partnerships for afforestation, enhancement of wildlife habitat; Promote site-specific eco-development programs; and Strengthen capacities and implement measures for captive breeding and release into the wild identified endangered species.

Biodiversity, Traditional Knowledge, and Natural Heritage

A large-scale exercise has been completed for providing inputs towards a National Biodiversity Action Plan. These inputs would be reviewed in terms of the

Objectives and Principles of NEP, 2004, scientific validity, financial and administrative feasibility, and legal aspects.

Freshwater Resources

(i) River Systems

a) Promote integrated approaches to management of river basins; b) Consider and mitigate the impacts on river flora and fauna, and the resulting change in the resource base for livelihoods, of multipurpose river valley projects, power plants, and industries; and c) Consider mandating the installation of water saving closets and taps in the building byelaws of urban centers.

(ii) Groundwater

a) assessing account of impacts on groundwater tables of electricity tariffs and pricing of diesel; b) Promote efficient water use techniques, c) Support practices of contour bunding and revival of traditional methods for enhancing groundwater recharge; d) Mandate water harvesting in all new constructions; e) Support R&D in cost effective techniques suitable for rural drinking water projects.

(iii) Wetlands

a) Set up a legally enforceable regulatory mechanism; b) Formulate conservation and prudent use strategies; c) Formulate and implement eco-tourism strategies for identified wetlands through multistakeholder partnerships involving public agencies, local communities, and investors; d) assess impacts on wetlands of significant development projects;

Mountain Ecosystems

a) Adopt "best practice" norms to avoid or minimize damage to sensitive ecosystems and despoiling of landscapes; b) Encourage cultivation of traditional varieties of crops and horticulture; by promotion of organic farming; c) Promote sustainable tourism;

Coastal Resources

a) Mainstream the sustainable management of mangroves into the forestry sector regulatory regime; b) Disseminate available techniques for regeneration of coral reefs; c) Embody considerations of sea-level rise in coastal management plans.

Pollution Abatement

(i) Air Pollution

Air pollution may have adverse impacts on human health, as well the health of other living entities, manmade heritage, and life-support systems, such as global climate. Depending upon the lifetime of the pollutants, the location of the source, and the prevailing air currents, the receptors may be located at homestead, local, regional, or global levels, at time intervals from near instantaneous, to several decades. The direct causes of air pollution are emissions from the use of fossil energy, and other industrial processes, and some consumption activities. Indoor air pollution beside serious health impact is associated with the low societal status of women, leading to continued use of polluting, inefficient biomass stoves. This could be due to inadequate policies and programs for redressing women's status. This is also linked with pricing policies for agricultural chemicals that need to be looked into. In addition, the following specific actions need to be taken:

a) Accelerate the national programs of dissemination of improved fuel wood stoves, and solar cookers, suited to local cooking practices.
b) Strengthen the monitoring and enforcement of emission standards for both point and non-point sources, with participation in monitoring by the local communities.
c) Prepare and implement action plans for major cities for addressing air pollution for both point and non-point sources, relying on a judicious combination of fiats and incentive based instruments.
d) Formulate a national strategy for urban transport to ensure adequate investment, public and private, in low-pollution mass transport systems.
e) Promote reclamation of wastelands by energy plantations for rural energy through multistakeholder partnerships involving the land owning agencies, local communities, and investors.

(ii) Water Pollution

The direct and indirect causes of pollution of surface (river, wetlands) water sources, groundwater, and coastal areas are evident from studies world over. The following comprise further elements of an action plan:

a) Develop and implement, initially on a pilot scale, public-private partnership models for setting up and operating effluent and sewage treatment plants.

b) Enhance reuse of treated sewage and industrial wastewater before final discharge to water bodies.
c) Enhance capacities for spatial planning among the State and Local Governments, with adequate participation by local communities, and to ensure clustering of polluting industries to facilitate setting up of common effluent treatment plants.
d) Promote R&D in development of low cost technologies for sewage treatment.
e) Take explicit account of groundwater pollution in pricing policies of agricultural inputs, especially pesticides, and dissemination of agronomy practices involving their use.
f) Develop a strategy for strengthening regulation, and addressing impacts, of shipbreaking activities on coastal and near marine resources.

(iii) Soil Pollution

The following are elements of an action plan:

a) Develop and implement viable models of public-private partnerships for setting up and operating secure landfills and incinerators for toxic and hazardous waste, both industrial and biomedical, on payment by users.
b) Develop and implement strategies for clean up of preexisting toxic and hazardous waste dumps.
c) Strengthen the capacities of local bodies for segregation, recycling, and reuse of municipal solid wastes, and setting up and operating sanitary landfills, in particular through competitive outsourcing of solid waste management services.
d) Give legal recognition to, and strengthen the informal sector systems of collection and recycling of various materials.
e) Promote organic farming of traditional crop varieties.
f) Develop and implement strategies for recycle, reuse, and final environmentally benign disposal of plastics wastes, including through promotion of relevant technologies, and use of incentive based instruments.

(iv) Noise Pollution

Persistent exposure to elevated noise levels has been established to result in significant adverse health impacts and need to be controlled. Societal well-being would require that exposure levels to third parties should be lower than level where adverse health impacts may occur. The following would comprise elements of an Action Plan on abatement of noise pollution:

a) Make appropriate distinctions between different environments in terms of setting ambient noise standards, e.g. rural versus urban; educational and medical establishments versus other areas; nighttime versus daytime in residential areas; areas in the vicinity of road, rail, and airport infrastructure; etc.
b) Distinguish between noise standards and protection measures in the context of occupational exposure, and environmental exposure to third parties.
c) Formulate noise emissions norms (e.g. loudspeaker, automobile horns, fireworks ratings) appropriate to various activities to ensure that exposure levels to third parties who are not participants in the activity do not exceed prescribed ambient standards.
d) Encourage dialogue between State/Local Authorities and religious / community representatives on the adoption of enforceable specific durations, timings, and use of loudspeakers/ fireworks, etc. in case temporary exceeding of prescribed ambient noise standards for observance of traditional religious/cultural/social events cannot be avoided.

Conservation of Manmade Heritage

Manmade heritage reflects the prehistory, history, ways of living, and culture, of a people and need to be protected in scientific and more research based manner.

Climate Change

India's Green house gases emissions at 1994 level were 1228 million ton (Mt) CO_2 equivalent, which is below 3% of global GHG emissions. In per-capita terms, it is 23 per cent of the global average, and 4 per cent of USA, 8 per cent of Germany, 9 per cent of UK and 10 per cent of Japan per capita emissions in 1994. In terms of primary energy use, India's share of renewable energy (being a non – GHG emitting energy form) at 36 per cent is far higher than industrialized countries can hope to reach in many decades. However, India's policies for sustainable development without demanding environment will continue.

Environmental Standards, Management Systems, Certification, and Indicators

a) Set up a permanent machinery to review notified

ambient and emissions standards

b) Strengthen the network for monitoring ambient environmental quality and on-line availability of the monitoring data.

Environmental Management Systems, Ecolabeling and Certification:

Environmental Management Systems (EMS), such as ISO 14000, by requiring the adoption of standardized environmental management practices, documenting their actual use, and third party verification of the fact, will be encouraged. The following actions would be taken:

a) Encourage industry associations to promote the adoption of ISO 14000.

b) Encourage adoption of EMS through purchase preference for ISO14000 goods and services for Government procurement, except for items reserved for the small-scale sector at any given time.

c) Formulate "Good Practice Guidelines" for ecolabels to enhance their scientific basis, transparency, and requirements of participation. Promote the mutual recognition of Indian and foreign ecolabels, which adhere to the Good Practice Guidelines, to ensure that Indian exporters enhance their market access at lower costs.

Clean Technologies and Innovation

Clean technologies minimize the generation of waste streams in the production processes themselves, rather than treating the waste after generation.

Environmental Awareness, Education, and Information

Enhancing environmental awareness is essential to harmonize patterns of individual behavior with the requirements of environmental conservation.

Partnerships and Stakeholder Involvement

A generic classification of some possible partnerships is as follows:

a) Public-Community Partnerships, e.g. Joint Forestry Management.

b) Public-Private Partnerships, e.g. monitoring of environmental quality.

c) Public-Community-Private Partnerships, e.g. afforestation of degraded forests.

d) Public-Voluntary Organization Partnerships, e.g. environmental awareness raising.

e) Public-Private-Voluntary Organization Partnerships, e.g. "Build, Own, Operate" sewage and effluent treatment plants.

Review of the Policy

Undertake consultations every three years with groups of diverse stakeholders.

Review of Implementation

Accordingly, the Cabinet Committee on Economic Affairs (CCEA) may be requested to review the implementation of NEP, 2004, once a year, within three months from the close of the previous fiscal year.

References

Govt. of India. Environmental Policy 2006. Ministry of Environment & Forest, Govt. of India.

Planning Commission of India. Tenth Five Year plan 2002-2007, Volume II, Chapter 1.

Hughes et. al. 2001: Environmental health in India: Priorities in Andhra Pradesh, Environment and Social Development Unit, South Asia Region, World Bank.

CHAPTER 60

NATIONAL CONSERVATION STRATEGY & POLICY STATEMENT ON ENVIRONMENT & DEVELOPMENT 1992

INTRODUCTION

Environmental Problems in India can be classified into two broad categories:

1. those arising as negative effects of the very process of development and
2. those arising from conditions of poverty and under development.

Population is an important resource for development yet it is a major source of environmental degradation when it exceeds the threshold limits of the support systems. The livelihood security of majority of our people depends on land and water based occupations such as crop and animal husbandry, forestry and fisheries. Out of total area of India which is 329 million hectares, 175 millions hectares of land require special treatment to restore such land to productive and profitable use. The degradation is caused by water and wind erosion, salinity, and alkalinity and river action and other factors. India forest wealth is dwindling due to overgrazing both for commercial and household needs, encouragement, unsustainable practices including certain practices of shifting cultivation and developmental activities such as roads, buildings, irrigation and power projects. There is only 19.5% of the total geographical area is forest whereas national goal is 33%. Another concern is extinction of plants and animal species. Over 1500 plants and animal species are in the endangered categories.

The quality of ground water is being affected due to chemical pollution and a coastal areas, due to the regress of sea water. The excessive use of fertilizers and pesticides impose threat to human health, to the genetic stocks and reduction in the natural soil fertility in the long run. Such pollution which is because of toxic waste and non-biodegradable consumer articles going to increase further.

Global atmospheric changes resulting in altered temperature (Global warming) and precipitation and rising ocean levels may lead to periodic floods, incursion of salt water melting of glaciers and river flooding. Local changes of average rainfall will severely affect agriculture and water supply.

ACTION TAKEN

1. Legal: many legislation are available to safeguard the environment.
2. Institutions: various central boards, institutions, agencies are working in the field of training, imparting education, research, etc.
3. Prevention and control of pollution: monitoring, change in processes, Ganga Action Plan are few examples.
4. Conservation of Forests and Wildlife: Adoption of New Forest Policy 1988, formulation of national wildlife action plan, national forestry action Program and formulation of a national river action plan.

5. Land and Soil: Survey, control shifting cultivation, drought prone areas Program, desert development Program.
6. Environmental Impact Assessment.
7. Other activities: National Environmental Awareness campaign, survey and research studies, training Programs, workshops, seminars.

Priority and Strategies for Action

1. Population Control: Launching a time bound national campaign for small family, increasing support for female education, female employment and social security Programs, easier access to the means of family planning and health care facilities, environmental sanitation, prevention and control of communicable diseases through integrated vector control and health education and adoption of decentralized renewable energy devices
2. Conservation of natural resources: a) Land and water classification, zoning and apportionment of land, enactment of laws for appropriate land use, protection of water bodies and soil, measures to ensure equitable access, micro-level planning in social forestry, afforestation, etc. b) Atmosphere: Use of clean fuels and clean technologies, raising green belt, developing coping mechanisms, controlling adverse impact on Indian continent due to *ozone depletion* and other gaseous effects, c) biodiversity: survey, networking of protecting areas, full and correct rehabilitation, protection and sustainable use of plants and animal genetic resources, d) biomass: raising fuelwood species, conserve and use resources of common lands and degraded forests, raising bamboos, production of fodder and grasses, etc.
3. Development policies from environmental perspectives: integration and internalization of environmental considerations in the policies and Programs of development in various sectors, curtailment of consumerism and shift towards use of environmental-friendly products and processes and low waste generating technologies in the field of agriculture and irrigation like pesticides, animal husbandry, forestry, energy generation and use, industrial development, mining and quarrying, tourism, transportation, and human settlement. International cooperation: appropriate technology transfer, training, education areas and development of infrastructure are good for international cooperation
4. Role of NGOs: NGOs are active in generating mass awareness on various issues of environmental conservation, protection, and environmental health. They need to be strengthened.
5. Women and Environment: Women development has been recognized one of the most vital components in environmental protection. They need to be empowered, educated, and strengthened with newer technology.
6. Partnership of state government and center.

Reference

Govt. of India National Conservation Strategy and Policy Statement on Environment and Development. Ministry of Environment and Forest, GOI, New Delhi 1992.

CHAPTER 61

NATIONAL HOUSING AND HABITAT POLICY 1998

INTRODUCTION

Housing is also one of the important components of human environment and health. Poor housing and overcrowding has been associated with many infectious and mental disease. Housing is also required for the safety, and comfort. There is always a problem of safe home however, lot of architectural development has been observed throughout the world. The biggest problem is availability of safe house. By 1997 the total housing shortages in the country was estimated to be 13.66 million units, out of which 7.57 million units would be in the urban areas. More than 90% of this shortage is for the poor and the low income category. It was estimated that an investment of Rs.1,51,000/- crores would be required to bridge this deficit, but not more than 25% of this will flow from banks, financial institutions, Central and State Governments. It was further estimated that Rs.2,50,000 crores shall be required for urban infrastructure during the Ninth Plan, but not more than 10% would be available from Government sources. Therefore no significant headway can be achieved without massive participation of the private sector. This called for creation of enabling environment by way of legal and regulatory reforms and fiscal concessions to encourage non-government sector to take up land assembly, housing construction and investment in infrastructure services.

The Government through a National Agenda declared "housing for all" as a priority area and has set a target of construction of 2 million houses every year with emphasis on the poor and deprived, out of which 0.7 million houses shall be constructed in the urban areas.

With this background, the New National Housing and Habitat Policy (NHHP) was formulated in 1998. The Policy was laid before the Parliament on 29.07.1998.

Objectives

The Housing and Habitat Policy 1998 aims at:

- Creation of surplus in housing stock either on rental or ownership basis
- Providing quality and cost effective shelter options, especially to the vulnerable groups and the poor
- Ensuring that housing, along with the supporting services, is treated as a priority and at par with infrastructure sector
- Removing legal, financial and administrative barriers for facilitating access to land, finance and technology
- Forging strong partnership between private, public and cooperative sectors to enhance the capacity of the construction industry to participate in every sphere of housing and habitat
- Using technology for modernizing the housing sector to increase efficiency, productivity, energy efficiency and quality
- Empowering the *Panchayat Raj* institutions and village cooperatives to mobilize credit for adding to the housing stock

The NHHP 1998 lays down the role of all the stakeholders for achieving the goal of providing shelter to all.

The Central Government would

- take steps to bring in legal reforms including formulation of effective foreclosure laws;
- devise macro economic policies to enable flow of resources to the housing and infrastructure sector;
- develop a debt market for housing and infrastructure fully integrated with the financial markets in the country;
- set up a National Shelter Fund to meet the requirement of low cost funds for the housing needs of the poor;
- promote research and development and transfer of technology for construction of houses;
- evolve parameters for optimal use of available resources to promote development and growth in a sustained manner;
- provide fiscal concessions for housing, infrastructure, innovative and energy saving construction materials and methods and also set up a regulatory mechanism to ensure that the concessions are correctly targeted and utilized;
- develop and enforce appropriate ecological standards to protect the environment and provide a better quality of life in human settlements; and
- promote the creation of a secondary mortgage market.

The **State Governments** would work in collaboration with Central Government or may develop its own housing policy. Similarly the local authorities would work in close association with state Governments. The Public/Private Housing Finance Companies would redefine their role and move away from their traditional approach to housing finance; develop and expand their reach to meet the needs of people. The Corporate, Private and Cooperative Sectors are asked to lead the role in land assembly, construction of houses and development of amenities, construction of houses, and to work out schemes for slum reconstruction on cross subsidization basis. There is a need of Research, and Technology Transfer, disseminate information about new technologies and provide training to construction workers in the use of new technologies.

Around 25% of the total population in India live in slum. In Delhi alone there are 1300 slums. Slums are the big challenge for housing policy.

References

Government of India. National Commission on Urbanization 1998. Ministry of Urban Affair and Poverty alleviation, GOI 1999.

Kishore J, Grewal I. Healthy mind in a happy family is the key to healthy city. Swasth Hind 1996; pp.83-85.

Kishore J, Neeraj Kumar. Paryavaran Swasthya: Manav Aawas aur Shaharikaran (Hindi): Aoragya Sandesh 1994; Sept-Oct: pp. 7-9.

CHAPTER 62

NATIONAL REHABILITATION & RESETTLEMENT POLICY 2007

Provision of public facilities or infrastructure often requires the exercise of legal powers by the state under the principle of eminent domain for acquisition of private property, leading to involuntary displacement of people, depriving them of their land, livelihood and shelter; restricting their access to traditional resource base, and uprooting them from their socio-cultural environment. These have traumatic, psychological and socio-cultural consequences on the affected population which call for protecting their rights, in particular of the weaker sections of the society including members of the Scheduled Castes, Scheduled Tribes, marginal farmers and women. Involuntary displacement of people may be caused by other factors also.

There is imperative need to recognize rehabilitation and resettlement issues as intrinsic to the development process formulated with the active participation of the affected persons, rather than as externally-imposed requirements. Additional benefits beyond monetary compensation have to be provided to the families affected adversely by involuntary displacement. The plight of those who do not have legal or recognized rights over the land on which they are critically dependent for their subsistence is even worse. This calls for a broader concerted effort on the part of the planners to include in the displacement, rehabilitation and resettlement process framework not only those who directly lose land and other assets but also those who are affected by such acquisition of assets. The displacement process often pose problems that make it difficult for the affected persons to continue their earlier livelihood activities after resettlement. This requires a careful assessment of the economic disadvantages and social impact of displacement. There must also be a holistic effort aimed at improving the all round living standards of the affected people. The aim should be to minimize large-scale displacement, as far as possible. Only the minimum area of land commensurate with the purpose of the project may be acquired. Also, as far as possible, projects may be set up on wasteland, degraded land or un-irrigated land. Acquisition of agricultural land for non-agricultural use in the project may be kept to the minimum; multi-cropped land may be avoided to the extent possible for such 'purposes, and acquisition of irrigated land, if unavoidable, may be kept to the minimum.

Government should, *inter alia,* take into consideration the alternatives that will (i) minimize the displacement of people due to the acquisition of land for the project; (ii) minimize the total area of land to be acquired for the project; and (iii) minimize the acquisition of agricultural land for non-agricultural use in the project. The options: assessment may be in terms of the alternative project plans, potentially suitable sites, technological choices available, or a combination of these. Suitable institutional mechanism should be developed and adopted by the appropriate Government

for carrying out the task in a transparent manner. Where large numbers of families are affected, it must be mandatory to do social impact assessments and provide all required infrastructural facilities and amenities in the resettlement area. More particularly, where the Scheduled Tribes people are being displaced in sizeable numbers, a well thought out Tribal Development Plan must be put in place. Furthermore, such a policy must specify clear timeframes within which the implementation of the rehabilitation package as well as utilization of the land shall be accomplished. Also, it should lay down an effective monitoring and grievance redressal mechanism. It is acknowledged that many State Governments, Public Sector Undertakings or agencies, and other requiring bodies either have their own Rehabilitation and Resettlement (R&R) policies or are in the process of formulating them. The provisions of the National Rehabilitation and Resettlement Policy, 2007 (NRRP-2007) provide for the basic minimum requirements, and all projects leading to involuntary displacement of people must address the rehabilitation and resettlement issues comprehensively. The State Governments, Public Sector Undertakings or agencies, and other requiring bodies shall be at liberty to put in place greater benefit levels than those prescribed in the NRRP-2007. The principles of this policy may also apply to the rehabilitation and resettlement of persons involuntarily displaced permanently due to any other reason.

The objectives of the Policy are as follows:

(a) To minimize displacement and to promote,' as far as possible, non-displacing or least-displacing alternatives;

(b) To ensure adequate rehabilitation package and expeditious' implementation of the rehabilitation process with the active participation of the affected families;

(c) To ensure that special care is taken for protecting the rights of the weaker sections of society, especially members of the Scheduled Castes and Scheduled Tribes, and to create .obligations on the State for their treatment with concern and sensitivity;

(d) To provide a better standard of living, making concerted efforts for providing sustainable income to the affected families;

(e) To integrate rehabilitation concerns into the development planning and implementation process; and

(f) Where displacement is on account of land acquisition, to facilitate harmonious relationship between the requiring body and affected families through mutual cooperation.

The definition of useful terms is given in this policy are as follows:

"agricultural laborer" means a person primarily resident in the affected area for a period of not less than three years immediately before the declaration of the affected area who does not hold any land in the affected area but who earns his livelihood principally by manual labor on agricultural land therein immediately before such declaration and who has been deprived of his livelihood;

"nuclear family" consisting of a person, his or her spouse and minor children;

"marginal farmer" means a cultivator with an un-irrigated land holding up to one hectare or irrigated land holding up to half hectare;

"non-agricultural laborer" means a person who is not an agricultural labourer but is primarily residing in the affected area for a period of not less than three years immediately before the declaration of the affected area and who does not hold any land under the affected area but who earns his livelihood principally by manual labour or as a rural artisan immediately before such declaration and who has been deprived of earning his livelihood principally by manual labour or as such artisan in the affected area;

"small farmer" means a cultivator with an un-irrigated land holding up to two hectares or with an irrigated land holding up to one hectare, but more than the holding of a marginal farmer.

Where the appropriate Government is satisfied that there is likely to be involuntary displacement of large number of persons due to acquisition of land for any project or due to any other reason, it may; and where the appropriate Government is satisfied that there is likely to be involuntary displacement of four hundred or more families *en masse*in plain areas, or two hundred or more families *en masse*in tribal or hilly areas, DDP blocks or areas mentioned in the Schedule to the Constitution due to acquisition of land for any project or due to any other reason, it shall, appoint, by notification, by the State. Government(s) concerned, in respect of that project, an officer not below the rank of District Collector of the State Government to

be the Administrator for Rehabilitation and Resettlement (R&R).

Rehabilitation and Resettlement Plan

Every declaration and affected area must be properly advertised in newpapers and also by affixing a copy of the notification on the notice board of the concerned *gram panchayats* or municipalities and other prominent place. The Administrator for Rehabilitation and Resettlement shall undertake a baseline survey and census for identification of the persons and families likely to be affected. Every such survey shall contain the following village-wise information of the affected families:-

(i) Members of the family who are permanently residing, engaged in any trade, business, occupation or vocation in the affected area;
(ii) Families who are likely to lose, or have lost, their house, agricultural land, employment or.are alienated wholly or substantially from the main source of their trade, business, occupation or vocation;
(iii) Agricultural labourers and non-agricultural labourers;
(iv) Families belonging to the Scheduled Caste or Scheduled Tribe categories;
(v) Vulnerable persons such as the disabled, destitute, orphans, widows, unmarried girls, abandoned women, or persons above fifty years of age; who are not provided or cannot immediately be provided with alternative livelihood, and who are not otherwise covered as part of a family;
(vi) Families that are landless (not having homestead land, agricultural land, or either homestead or agricultural land) and below poverty line, but residing continuously for a period of not less than three years in the affected area preceding the date of declaration of the affected area; and
(vii) Scheduled Tribes families who are or were having possession of forest lands in the affected area prior to the 13th day of December.

After the period of ninety days from the date of declaration the officers will invite objections and suggestions from all persons likely to be affected thereby. He /she shall submit recommendations and shall ensure that the affected families may be settled, wherever possible, in a group or groups in such resettlement areas. However, it has to be ensured that the affected families may be resettled with the host community on the basis of equality and mutual understanding, consistent with the desire of each group to preserve its own identity and culture.

The Administrator for Rehabilitation and Resettlement, on behalf of the "appropriate Government, may either purchase land from any person through consent award and may enter into an agreement for this purpose, or approach the State Government concerned for acquisition of land for the purposes of rehabilitation and resettlement scheme or plan.

Benefits to the Affected Families

1. Free house site to the affected families
2. House for affected displaced BPL families
3. Land to land to the extent of availability of government land.
4. If land or employment is not provided then family should get rehabilitation grant equal to 750 days of agriculture wages.
5. Fishing rights in the reservoir to be offered to the projected affected families.
6. In case of allotment of wasteland in lieu of acquired land, development grant shall be a minimum of Rs. 15000/- per hectare.
7. Land or house should be in the joint name of wife and husband of the affected families.
8. Rs. 15000/- as grant for construction of cattle shed. Rs. 10000/- as transportation charges for shifting the belonging from the site to rehabilitation site.
9. Preference in providing livelihood support like employment, skill development, economic opportunities, scholarship to the eligible person in project jobs will be given to affected families.
10. Monthly subsistence allowance equivalent to 25 days minimum wages for one year from the date of displacement and monthly pension of Rs. 500/ - to the vulnerable affected person shall be given.

Reference

Gazette of India. National Rehabilitation and resettlement Policy 2007. Ministry of Rural Development, Government of India.

Part -III

Legislation Related to Health

CHAPTER 63

LEGISLATIONS RELATED TO HEALTH

The Core of public health depends on law and science and it is also true that without the coercive power of the state, public health and modern society would be impossible. Law has to prohibit individuals who create the situation for others suffering. Applications of prohibitory power on individual autonomy would be unwelcomed in democratic world. For this reason, public health must maintain the balance between individual autonomy and community protection. In majority of the countries, the state's police powers deal with general issues of public health and safety, not the punishment of criminals. Public health police powers are exercised by health officers, fire officers, municipal commissioners, and judges. The public health actions are not intended to punish, but to improve and to monitor the health status in the community.

Law creates public health agencies, designates their mission, provides authority and limits their actions to protect a sphere of freedom outlined by the constitution. Just as threats like Anthrax, SARS, Avian Influenza, teaches us about the importance of a strong public health infrastructure, they also remind us of the need for appropriate public health powers. The mandate to 'Fulfill Society's Interests' and 'Assure healthy conditions and quality services puts public health in frequent and compelling contact with the legal system (Ananthanarayanan 2006).

Public Health Laws is the study of the legal powers and duties of the state to assure the conditions for people to be healthy (e.g. to identify, prevent, and ameliorate risks to health in the population), and the limitations on the power of the state to constraint the autonomy, privacy, liberty, proprietary, or other legally protected interests on the individual for protection or promotion of community health'. Following characteristics public health law (Ananthanarayanan 2006) are:

1. *Government* – Public health activities are the primary (but not exclusive) responsibility of the Government. Government aerates policy and enacts low and regulations designed to safeguard community health.
2. *Population* – Public health focuses on the health of population. Certainly, public health authorities are concerned with access and quality in medical care, but their principal concern is to create the conditions in which communities can be health.
3. Relationship – Public health contemplates the relationship between the State and the population (or between the State and individuals who place themselves or the community at risk).
4. Services – Pubic deals with the provision so population based services grounded on the scientific methodologies of public health.
5. Coercion- Public health authorities possess the power to coerce individuals and businesses for the protection of community rather then relying on a near universal ethic of voluntarism.

The Indian Constitution has sufficient provisions for the protection, promotion and growth of every

individual, worker and group and vulnerable population in relation to nutrition and health. To achieve these fundamental goals of the country various Acts and Rules are enancted. ***Act*** means a statute or law adopted (enacted) by a national or state legislative or other governing body Acts are distinguished from resolutions, which are usually used to express legislative opinion or to regulate affairs of the governing body itself, and from ordinance or by laws of municipal corporation and rules and regulations of administration. ***Rules*** are explicit statements that tell an employee what he or she ought or ought not to do (Kishore 2007).

Important Indian legislations in this direction are grouped in following categories for better understanding but these categories are arbitrary:

A. To protect the rights of health and Improve the health of the Nation in a comprehesive manner

- National Health Bill 2009

B. To Improve and Maintain High Standards in the Medical Education and Services:

- The Indian Medical Council Act, 1956 and Regulations 2002
- The Indian Nursing Council Act, 1947
- The Dentists Act, 1948
- The Pharmacy Act, 1948
- The Rehabilitation Council of India Act, 1992
- The Indian Medicine Central Council Act, 1970,
- The Homeopathy Central Council Act, 1973
- The Consumer Protection Act (CPA), 1986

C. Public Registration to Assess Mortality and Enumeration of Population

- The Registration of Births and Deaths Act, 1969
- The Census Act 1948

D. To Prevent Public Health Problems:

- The Epidemic Diseases Act, 1897
- The Delhi Antismoking & Nonsmoking Health Protection Act, 1996
- The Transplantation of Human Organ Act, 1994
- The Prevention of Food Adulteration Act, 1954
- The Indian Air Craft (Public Health), Act 1934, and Rules, 1954
- Public Liability Insurance Act, 1991
- National Commission Proceeding Rights Act, 1994
- Essential Commodity Act, 1955
- The International Health Regulation

E. To Achieve Maternal Health and to Empower the Women:

- The Medical Termination of Pregnancy (MTP) Act, 1971
- The Maternity Benefit Act, 1961
- The Dowry Prohibition Act, 1961
- The Dowry Prohibition (Maintenance of List of Presents to the Bride and Bridegroom) Rules, 1985
- The Immoral Traffic (Prevention) Act, 1956
- The Prenatal Diagnostic Techniques (Regulation and prevention of misuse) Act, 1994
- The Hindu Succession Act, 1956
- Indecent Representation of Women (Prohibition) Act, 1986
- Commission of Sati (Prevention) Act, 1987

F. To Safeguard the Children and Young:

- The Infant Milk Substitutes, Feeding Bottlers &Infant Foods (Regulation of Production, Supply & Distribution) Act, 1992
- The Juvenile Justice Act, 1986
- The Child Labor (Prohibition & Regulation) Act, 1986
- The Child Marriage Restraint Act, 1929
- The Adoption and Maintenance Act 1956

G. To rehabilitate and provide equal opportunity to disabled and disadvantaged groups:

- The Persons with Disabilities (Equal opportunity,
- Protection of Rights and Full Participation) Act, 1995
- The Mental Health Act, 1987
- The SCs & the STs (Prevention of Atrocities) Act, 1989

H. To Prevent Drug Addiction and Substance Abuse and Safe Manufacturing of drugs, Distribution and Storage:

- The Narcotic Drugs and Psychotropic Substances Act, 1985
- The Drugs and Cosmetics Act, 1940
- The Drugs (Control) Act, 1948
- The Drugs & Magic Remedies (Objectionable Advertisements) Act, 1954

I. To Protect Workers and to Provide Social Security:

- The Minimum Wages Act, 1948

- The Dangerous Machine (Regulation) Act, 1983
- The Plantation Labor Act, 1951
- The Factories Act, 1948
- The Mines Act, 1952
- The Employees State Insurance (ESI) Act, 1948
- The Workmen's Compensation Act, 1923
- The Bonded Labor System (Abolition) Act
- The Trade Union Act, 1926
- The Dock Workers (Safety, Health and Welfare) Act, 1986
- The Mines Labor Welfare Fund Act, 1972
- The Bidi Workers Welfare Fund Act, 1972
- The Cigar Workers (Conditions of Employment) Act, 1966
- The Contract Labor (regulation & Abolition) Act, 1970
- The Boiler Act, 1923
- Payment of Wages Act, 1936
- Payment of Bonus Act, 1965
- Weekly Holiday Act, 1942

J. Environmental Legislation

- The Environment (Protection) Act, 1986
- The Biomedical Waste (Management & Handling) Rules, 1998
- The Municipal Solid Waste (Management & Handling) Rules, 2000
- The Hazardous Waste (Management & Handling) Rules, 1989
- The National Environmental Tribunal Act, 1995
- The Air (Prevention and Control of Pollution) Act, 1981
- The Water (Prevention and Control of Pollution) Act, 1974
- The Atomic Energy Act, 1962
- The Insecticides Act, 1988
- The Delhi Municipal Corporation Act, 1957
- The Motor Vehicles Act, 1988
- Wild Life (Protection) Act, 1942
- Destructive Insect & Pest Act, 1914

K. To Promote Voluntary Work:

- The Red Cross Society (Allocation of Property) Act, 1936
- The Societies Registration Act, 1860

Under the Constitutional provisions, the government of India owes its population social security, health services, safety, environmental protection, equal opportunity, and justice. The methods adopted by the government to deliver these services are framing policies, execution of legislation and implementation of programs. Running a program is the most desirable action. However, it is also essential to make some services mandatory and should be under the rules and regulations. The government and the people are required to carry out their duties to achieve the Constitutional objectives. For this, the Constitution also provide powers to frame the legislation. The provision of an Act is further explained in detail in rules and regulations. These laws must be specific and written so that the potential violators can be identified. An individual can not be punished for a new type of behavior until a law has been passed against the behavior.

In addition to improving the health of the people, these legislations also have provision of legal action against those trying to jeopardize it, in any way. Unfortunately, these legislations are not implemented as designed, due to some reasons and public health remains vulnerable to social, psychological and physical situations.

In the area of public health, India is lacking of a comprehensive National Public Health Act in which preparedness for epidemics and disasters, surveillance of communicable and noncommunicable diseases, environmental sanitation including safe water supply, waste disposal, and preventive and curative health care services should be appropriately handled. Number of legislations provides tremendous power to public health functionaries that need to be realized. Public Health officials have four primary enforcement tools:

- Permits, licenses, and registrations;
- Administrative orders;
- Civil penalties; and
- Injunctions.

The public health laws suffer from problems of antiquity, inconsistency, redundancy, and ambiguity that render these laws ineffective or even counter productive, in advancing the population's health. These laws often do not reflect contemporary scientific understandings of injury and disease or legal norms for protection of individual rights. It is desirable to develop a public health law program designed to improve the scientific understanding of the interaction between law and public health and to strengthen the legal foundation for public health practice.

All public health legislations use these tools for enforcement and wherever these tools are lacking the legislations are ineffective. However, there are many other factors of failure of legislations such as lack of awareness, lack of infrastructure, etc. There are many discrepencies among various Act which limits its implementation: For example:

1. In PCPNDT act any MBBS can do ultrasound but in the rules you need an exam.
2. In PCPNDT act, you need to fill F16 form, where the information you need to fill is against the ethics. A diagnostic person cannot divert the patient for further investigations without the consent of referral doctor.
3. In the PCPNDT act the onus of proving non guilty lies on the doctor?
4. MCI says doctors are service provider but CPA act says you are a commercial health provider
5. MCI says do not discriminate patients on lines of Nationality but the Human Organs Transplant act says do not give preference to foreigners.
6. MCI says consent is required of both partners in sterility cases but Health Ministry guidelines says only one consent is sufficient.
7. Delhi Medical Council act says the council can give compensation but MCI act has no previsions when it comes to an appeal.
8. MCI says to doctors do not advertise but hospitals can as they are not covered under MCI act.
9. Clinical establishment act says that doctor's professional fee can be controlled by the government.
10. Whether you are modern medicine expert, Homeopath or Ayurveda expert you can write doctor
11. Even healthcare providers who have no write to prescribe are writing doctor in front of their name: physiotherapists.
12. In MCI act for the appeal against the state medical council order you have to approach health ministry but in MCU rules you can approach the MCI ethics committee.
13. There is no statuary provision in MCIU act that state medical councils have to obey the decisions of MCI
14. Medical profession says one need to get emergency care within four minutes of medical crises but the government norms says zyou can not practice in residential areas
15. Principals of natural justice say you can get pleaded by a lawyer in any court but Delhi Medical Council says you cannot bring a lawyer when there is a case against you.

Our social activists have very important role to play in realization of basic fundamental rights provided in the Indian constitution by legal education and working with masses. In the same direction government of India has initiated National Legal Literacy Mission in 2005. Under this mission public health professionals should take part of impart education on legal aspect of public health.

NATIONAL LEGAL LITERACY MISSION

On the 6th March 2005 the National Legal Services Authority (NALSA) initiated endeavor to empower the economically and socially disadvantaged citizens by making them legally literate. It has been realized that complex language of statutes acts as a hurdle to legal literacy and an increase in legal literacy ultimately develops into a transparent and accountable government. In order to create legal awareness in rural India, the National Legal Literacy Mission has launched the legal awareness campaign aptly named "Chalo Haat Haat". The project seeks to sensitize, and create awareness among people about their legal rights. Initially the project plans to cover district headquarters in 12 states to launch the awareness drive and cover Haats and surrounding villages to reach out to the rural masses including working class and manual laborers.

Activities

Briefing, audio publicity distribution of literature on legal issues, interactive games on legal rights, theme games such as antakshari, and quiz are major activities of the project. People's grievances and relief petitions will be collected and database will be generated for the people at the referral booths.

References

Ananthanarayanan PH. Public Health Law. Ind J Public Health 2006; 50 (4): 207-8.

Intitute of Medicine. The future of public health. Washington DC: National Academy Press 1988.

National Legal Services Authority. Ministry of Law and Justice, Govt. of India 2005.

CHAPTER 64

NATIONAL HEALTH BILL 2009

INTRODUCTION

Bill states that every human being is entitled to enjoyment of the highest attainable standard of health and well-being, conducive to living a life in dignity. Health is a fundamental human right indispensable for, and intricately linked with, the exercise of all other human rights. Right to health is an inclusive right extending not only to timely and appropriate health care but also to the underlying socio-economic, cultural and environmental determinants of health. There is need to involve civil organizations and communities for their health. To achieve delivery of essential also of quality public health services and functions there is also the need to set a broad legal framework (also focuses on norms and standards), including powers to respond to public health emergencies, principally through the State and local public health agencies, in collaboration with others in the public health system, including through the cooperation and formal collaborations between the Center and State.

Obligation of the Constitution of India

the Constitution of India places obligations on the Government to ensure protection and fulfillment of right to health for all, without any discrimination, as a Fundamental Right under Articles 14, 15 and 21 (rights to life, equality and non discrimination), along with some relevant fundamental rights under Article 17 (abolition of untouchability); Article 23 (prohibition of traffic in human beings and forced labor); and Article 24 (prohibition of employment of children in factories, etc.); and also urges the State, under the Directive Principles of State Policy, to eliminate inequalities in status, facilities and opportunities (Article 38); to strive to provide to everyone certain vital public health conditions such as health of workers, men, women and children (Article 39); right to work, education and public assistance in certain cases (Article 41); just and humane conditions of work and maternity relief (Article 42); raised level of nutrition and the standard of living and improvement of public health (Article 47); and protect and improve environment (Article 48A); and identifies certain concomitant 'Fundamental Duties' like obligating every citizen to denounce practices derogatory to the dignity of women; and to protect and improve the natural environment (Article 51).

Obligations of International Commitments

The Union of India has signed various international treaties, agreements and declarations specifically undertaking to provide right to health including but not limited to: Universal Declaration of Human Rights (UDHR): Article 25 (1); international Covenant on Economic, Social and Cultural Rights (ICESCR): Article 12; Convention on the Rights of the Child (CRC): Article 24; Convention on the Elimination of All Forms of Discrimination against Women (CEDAW): Article 12; UN Convention on Rights of persons with disabilities (UNCRPD): Article 25;

Declaration of Alma Ata (1978); Principles for the Protection of Persons with Mental Illness and the improvement of Mental Health Care (1991); Declaration on the Elimination of Violence against Women (1993), Program for Action of the International Conference on Population and Development, Cairo (1994); Platform of Action for the Fourth World Women's Conference, Beijing (1995) and the Millennium Development Goals (2000); Declaration of Commitment on HIV/AIDS, 'Global Crisis-Global Action' (2001), WTO Doha Declaration on TRIPS Agreement & Public Health (2001), International Health Regulations, 58th World Health Assembly (2005); WHO Framework Convention on Tobacco Control (WHO FCTC 2005), and several other declarations and conventions on underlying determinants of health. It is necessary to give effect to these international treaties and declarations under Article 253 of the Constitution of India.

Obligations of the Supreme Court of India

The Hon'ble Supreme Court of India has, in several judgments, exhorted the Government of India to accord legal recognition to the health rights as vital component of the fundamental right to life; and the National Human Rights Commission has also directed the Government of India to enact a health law.

Obligations of Government

The Union of India is also mandated to legislate on: population stabilization and family planning; mental health; drugs; food safety; labor safety and welfare, including maternity benefits; social security and social insurance; employment; education; legal and medical professions; prevention and control of communicable diseases; registration of births and deaths and other vital statistics for health; port quarantine, seamen's and marine hospitals; and all the other health related social and economic planning

The Union of India has already enacted several laws in recent times, including, the Environment Protection Act, 1986; Mental Health Act, 1987; Constitution (73rd and 74th) Amendment) Act, 1992, setting up Panchayats and urban local bodies, Persons With Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995; Constitution (86th Amendment Act), 2002 establishing fundamental right to education; Cigarettes and other Tobacco Products (Prohibition of Advertisement and Regulation of Trade and Commerce, Production, Supply and Distribution) Act, 2003; Protection of Women from Domestic Violence Act, 2005; National Rural Employments Guarantee Act, 2005; Disaster Management Act 2005; Food Safety and Standards Act 2006, which have created favorable conditions for the achievement of goal of health for all.

PREAMBLE

CHAPTER I: **Preliminary**

Title of the Act shall be the Health Act, 2008 and extends to the whole of India except the State of Jammu and Kashmir. The Act defines various terms such as affordable, health care providers and institutions, government, communicable non-communicable diseases, life style diseases, epidemic, public health emergency, emergency of international concerns, impact assessment, health information system, health research, IEC, technology, indicators, universal precaution, and rights to health, water, sanitation, food, education, etc.

CHAPTER II

Obligations of Government in relation to Health:

- **General obligations towards progressive realization of health and well being (Sec 3):**

These are as follows:

a) Undertake appropriate and adequate budgetary measures, as per the globally accepted norms, ensuring transparency and equity in the allocation, planning and rational allocation and distribution of resources; (b) Take all measures and steps, for addressing bio-medical and socio-cultural determinants;

c) Provide free and universal access to health care services prioritizing vulnerable and marginalized people and no denial by any health care service provider, public or private institution;

d) Ensure comprehensive involvement of civil society and to participate in all health related decision-making processes and program;

e) Adopt the least restrictive alternative to ensure public health over individual rights;

f) Ensure that all their policies, especially the economic, agricultural, industrial, technology related, intellectual properties related, be subject to health and equity impact assessments;

g) Ensure convergence among programs of all the sectors;
(h) Take into account its legal obligations regarding the right to health when entering into any agreements with organizations, countries, etc.

- **Core obligations towards determinants of health**

These are as follows:

a) Ensure equitable distribution of and access to essential health facilities, goods, drugs, services and conditions to all, and especially for vulnerable or marginalized groups;
b) Ensure access to the minimum essential food which is nutritionally adequate and safe, to ensure freedom from hunger and malnutrition to everyone;
c) Ensure adequate supply of safe water;
d) Ensure sanitation, effective sewerage and drainage systems, waste disposal and management systems, pollution control systems, control of ecological degradation, control of insects and rodents and other carriers of infections;
e) Ensure access to basic housing with dignity, access to basic facilities, and protection from forced eviction, harassment or other threats; and
f) To devise, adopt, implement, and periodically review, health policies, strategies and plans of action, on the basis of epidemiological, sociological and environmental evidence.

Provided that until the policies and plans are notified by the Central Government under this Act, all national plans, policies, programs shall deemed to be as such under this Act. However, within 6 months of this Act coming into force they would be assessed and necessary modified shall be made. Within 1 year of this Act, the Central Government shall adopt and implement national strategies and plans of action, and within 6 months thereafter, the State Governments shall accordingly adopt and implement compatible State level strategies and plans of action through their respective local bodies.

- **Obligations to provide access to quality health care services**

These are as follows:

a) Ensure all the rights related to health care as laid down under this Act;
b) Take effective measures to prevent, treat and control epidemic and endemic diseases;
c) Lay down specific standards and norms for safety and quality assurance of all aspects of health care including health care services and processes, treatment protocols, infrastructure, equipment, drugs, health care providers, within the Government, private and other non-government sectors; The current Indian Public Health Standards (IPHS) shall be treated as the standards but within 6 months, they shall be reviewed within the framework of this Act;
d) Provide education and access to information concerning the main health issues in the communities;
e) Set up health information systems (HIS);
f) Provide appropriate training for health personnel;
g) Ensure women's health including their reproductive health care;
h) Ensure children's health, including their comprehensive health care services;
i) Provide appropriate and best available preventive measures against the major infectious diseases occurring in communities;
j) Take effective measures in situations of public health emergencies; and
k) Take effective measures to towards occupational safety and industrial hygiene.

- **Specific public health obligations:**
  - ***Obligations of Central Government***

Preventive treatment and control measures for following are as follows:

a) Prevention and control of communicable diseases;
b) Public health emergencies of international concern;
c) Registration of births and deaths and other vital statistics for health;
d) Food safety;
e) Safety, availability and accessibility of drugs; rational use of drugs and monitoring of microbial resistance;
f) Labor safety and welfare, including maternity benefits;
g) Port quarantine, seamen's and marine hospitals;
h) Health related aspects of social security and employment;
i) Population stabilization and family planning,
j) Special public health measures for certain

vulnerable or marginalized;

k) Coordination of public health policies and actions at the State levels.

o ***Obligations of State Governments***

Preventive treatment and control measures for following are as follows:

a) Disease outbreaks;
b) Public health emergencies;
c) Health establishments and all the facilities providing health services;
d) Health nuisances and bio-medical waste;
e) Availability and accessibility of safe drinking water;
f) Sanitation and environmental hygiene, including waste management for every kind of waste;
g) Hygiene and safety in places and situations of public health importance including fairs, festivals, cinema, theatres, circuses, markets, shopping places, malls, lodging houses, burial and burning grounds, slaughter houses;
h) Environmental disasters, environmental safety,
i) Occupational safety and industrial hygiene;
j) Health Impact Assessment (HIA) of all new development projects;
k) Protection from and abatement of hazardous and injurious substances and activities or any other health hazards;
l) Lifestyle related diseases; mental illnesses, widely prevalent diseases; public health related factors like use of tobacco, alcoholism and other substance abuse, and consumption of unhealthy foods; and promotion of healthy lifestyles like breast feeding, health seeking behavior, balanced diet, regular exercising, food and water safety, including with regard to their packaging, labeling, advertising and sale and consumer protection, including regulating advertising and taxation and excise polices that have impact on these;
m) Road and transport safety, accident injuries/ trauma care;
n) Special public health measures for vulnerable or marginalized individuals and groups of population; and
o) Any other public health measures towards ensuring health and well being of all, including physical, emotional and mental health.

- **Obligations to respect, protect and fulfill**

The Governments shall take following measures:

a) The obligation to *respect,* which requires the Governments to refrain from denying or interfering, directly or indirectly, with the enjoyment of the right to health mentioned hereunder, by any individual or group;
b) The obligation to *protect* which requires the Governments to take measures that prevent third parties from interfering with the health rights mentioned herein; and
c) The obligation to *fulfill* which requires the Governments to pro-actively facilitate, provide and promote the health rights mentioned herein, by adopting appropriate legislative, administrative, budgetary, judicial, promotional and other measures.

CHAPTER III

Collective and Individual Rights in relation to Health:

✓ Right to health: Every person has the right to a standard of physical and mental health conducive to living a life in dignity
✓ Right to access, use and enjoy: Every person has the right to access, use and enjoy all the facilities, goods, services, programs and conditions necessary for ensuring the right to health, including but not limited to at least the following:
(a) Right to food;
(b) Right to water;
(c) Right to sanitation;
(d) Right to housing;
(e) Right to appropriate health care, and health care related functional equipment and other infrastructure, trained medical and professional personnel, and essential drugs; appropriate health-related IEC, including on sexual and reproductive health, to be able to make more informed health related choices
(f) Protection from and mitigation during environmental disasters, disease outbreaks/ epidemics, and other public health emergencies;
(g) Protection from and abatement of hazardous and injurious substances and activities; road and transport safety; industrial hygiene and occupational safety; hygiene and safety in places

and situations of large collection of people occasioning mass food production or disposal of biological wastes including at fairs, festivals, cinema, theatres, circuses, markets, shopping places, malls, lodging houses, burial and burning grounds, slaughter houses; and

(h) Health Impact Assessment (HIA) of all new development projects.

Health services should be made available, acceptable, assessable, of good quality, appropriate, timely,

- ✓ Right against discrimination
- ✓ Right to dignity
- ✓ Right of participation, information
- ✓ Right to justice
- ✓ Rights specifically related to health care (Users' Rights):
  - o Survival, integrity and security
  - o Right to seek health care and treatment
  - o Right to receive, use and enjoy health care and treatment
  - o Right to emergency treatment and care
  - o Right to reproductive and sexual health care
  - o Right to quality of care
  - o Right to rational health care
  - o Right to choice
  - o Right to be treated by a named health care provider
  - o Referral rights
  - o Right to continuity of care
  - o Right to fair selection
  - o Right to benefits of scientific progress and technology assessment
  - o Right to terminal care
  - o Right to information
  - o Right to medical records and data
  - o Right to autonomy/ self determination and prior voluntary informed consent
  - o Right to confidentiality, information disclosure, privacy
  - o Rights towards the application of users' rights

✓ Duties of users: Every user has the following duties:

i) To provide health care providers with the relevant and accurate information for health care;

ii) To comply with the prescribed health care;

iii) To take care of health records in his or her possession;

iv) To respect the rights of health care providers by treating them with respect, courtesy, and dignity and refrain from any abuse or violent or otherwise abusive behavior towards them or the rights provided to them; to similarly respect rights of other users;

v) To utilize the health care system properly and not indulge in any other abuse or obstructionist action;

vi) To not lure any care provider or staff in the health care establishment or facility with favors in terms of cash or kind for any personal gains or illegal purpose;

vii) To sign a discharge certificate or release of liability if he or she refuses to accept recommended treatment; and

viii) To recognize his/her role not merely as an end-user but as a proactive stakeholder and facilitator of the health care services provided to him/ her.

✓ Rights of health care providers vis-à-vis users

i) Every health care provider has the right to immunity against and protection from any adverse consequences for providing his/ her services of any kind as long as the provider has acted to the best of his/ her professional capability and judgment, bonafide and in the best interest of the user, and exercised all reasonable care;

ii) Every health care provider has a right to be treated with respect and dignity by his/ her user;

iii) Rights to have following protective and preventive measures undertaken by the health care establishment against:

a) Injury or damage to the person and property; and

b) Disease transmission or occupational exposure including communicable diseases. Provision of standard universal safety precautions and post exposure prophylaxis, effective infection control measures, personal protective equipment and employment of other safe work practices that prevent exposure to or reduce the risk of transmission of pathogenic agents, and shall include information, education, training, and sensitization for access and use of these.

The health care institution shall also formulate and notify treatment and compensation policies.

iv) No health care establishment shall discriminate against a health care provider in matters

concerning employment and conditions of employment on age, sex, economic status, place of residence, religion, caste, physical or mental disability that does not substantially affect his or her work.

v) A health care provider shall not be forced by the Government or any private party to reveal private confidential health information pertaining to any user or perform any act that is against medical ethics.

vi) A health care provider has the right to, in consultation with the head of the health care establishment, refuse to treat a user who is physically or verbally abusive or who sexually harasses him or her or who acts contrary to the users' duties as enumerated herein;

vii) A health care provider who faces legal action initiated by any user or the user's representative, either individually or along with the health establishment where he is employed, shall be supported, and the necessary legal costs shall be borne by the employer establishment in his legal defense, in the case initiated by the user or the user's representative, even if the employer establishment may hold him responsible and/or later initiate any separate administrative, disciplinary or legal inquiry/ action against him in that regard.

CHAPTER IV

Implementation & Monitoring Mechanism:

- National Public Health Board: constitution and composition; functions:

(I) A National Public Health Board shall be set up which shall consist of the following persons:

a) The Secretary, Ministry of Health and Family Welfare, as chairperson;

b) The Director General of Health Services, as co-chairperson;

c) Secretaries or their nominees, from Ministries pertaining to women and child development, rural and urban development, social justice and empowerment, environment, industry, food and agriculture, Panchayati Raj, finance, information & broadcasting or any other pertinent area; nominee of Planning Commission;

d) 5 representatives from National Directorate of Health Services;

e) 5 representatives from the State Governments (who will be appointed by rotation every 3 years so that all States get represented by turns);

f) 5 representatives of recognized professional associations and statutory councils relating to health at national level; and

g) 5 expert representatives of national eminence, from various areas of technical expertise or knowledge on health;

h) 5 representatives of civil society with demonstrated concern with public health issues.

Functions: Formulating, negotiating and adopting the health related national policy, programs, norms, standards, guidelines and ensuring that there is a revision every five years and that the plans, policies and programs for health and the public expenditure on health are consistent with this Act. Also establishing national and state level regulatory bodies to ensure implementation, supervising and monitoring.

- State Public Health Board constitution and composition; functions
- Decentralization and convergence in District, Block and Village level planning and
- Implementation authorities
- Monitoring Systems:
  (a) Health Information Systems (HIS);
  (b) Government monitoring; and
  (c) Community based monitoring;
- Government Monitoring
- Community based monitoring framework

CHAPTER V

Redressal Mechanism for Health Rights:

Disputes Resolution through Public Dialogues and Public Hearings *(Swasthya Jan Sunwais)*; issues, outcome and follow-up: The State and Central Governments shall facilitate forums for amicable and non-adversarial disputes resolution at community level by establishing mechanism of

- public dialogues and public hearings on health *(Swasthya Jan Sunwais)*
- Grievance redressal through In-house Complaints Forums at the institutional level
- Cause of action for complaints related to health, before designated district courts
- Remedies
  - ✓ Orders of designated district courts

- ✓ Reasoned order
- ✓ Costs
- ✓ Binding effect
- ✓ Consequences of Breach of designated court's Temporary Orders
- ✓ Appeals
- ✓ Timeframe for designation of courts
- ✓ Dispensing of lawyer's appearance and waiver of court fee
- ✓ Information on website

- Enforcement of monetary orders:
  - ✓ Recovery as arrears of land revenue
  - ✓ Maintenance of insurance cover by private health establishments
  - ✓ Health Reparation Funds by Central and State Governments

CHAPTER VI

Residuary offences, penalties & immunities

- ***Criminal penalties***

(i) Penalty for willful commission of unspecified offences: Any person acting under this Act who willfully violates or obstructs the execution of any provision, regulation, or rule, or order under this Act, shall be liable to be prosecuted for misdemeanor and upon conviction, shall be punishable by a fine not to exceed Rs. 10,000 or imprisonment for a period not to exceed 3 months, or both.

ii) Enhanced Penalties: The maximum penalties described above shall be doubled for every subsequent conviction of any person arising out of a violation or violations related to a set of circumstances that are different from those involved in the previous violation or set of related violations.

iii) Statute of Limitations: Any action under this Section is barred unless the action is commenced within two years after the cause of action accrues.

iv) Separate Offence: Each violation of this Act, which amounts to an offence, shall be treated as a separate offence.

- Immunities

  State and official is immune to punishment if the action is carried out in good faith and to implement the Act.

CHAPTER VII

Miscellaneous

- Power to make Rules, Regulations, Bye-laws and issue Orders
- Relationship with other health related laws, repeal and savings
- Reports & effective date

CHAPTER VIII

Financial Memorandum

Schedule I: Illustrations of Government's obligations to respect, protect, fulfill health rights

Schedule II: List of issues/ areas for laying down Regulations

Schedule III: List of Enactments that must be subjected to compatibility review under Section 37 of this Act

Reference

Govt. of India. National Health Bill 2009 (draft) MOHFW.

CHAPTER 65

LEGISLATION RELATED TO QUALITY OF PROFESSIONAL EDUCATION AND SERVICES

Role of doctors in society

In 1848, Rudolf Virchow asserted that "medicine is a social science, and politics nothing but medicine on a grand scale" (Ackerknecht 1953). Regarded by many to be the father of modern pathology, Virchow saw clear responsibilities for doctors to engage with the broader social concerns that cause illness and harm. A century and a half later, human health faces threats ranging in scale from terrorism and climate change to the consequences of violence, substance misuse, poverty and environmental hazards that we deal with every day in emergency departments, health centers and clinics. On a handful of issues, such as smoking, financing health, maternal and child mortality health care professionals have been instrumental in changing public policy. But, with many ongoing social ills, is civic action a duty of modern clinicians?

But anyone working in the health professions is concerned with prevention as well as healing, that medicine cannot escape politics, and to reduce the burden of harm caused by violence, doctors must address how the political determines the clinical (Horton 2001). During the last century initially there was more focus on curative medicine and medical practices deviated from social and environmental issues.

In the most recent 50 years, the difference between public health and other medical disciplines has become less polarized, due especially to three scientific and sociological developments. The first was the birth of modern epidemiology and multivariate analysis. They demonstrated that most major illnesses were not random occurrences and that peoples' overall health status was not only a consequence of the care they received. We now know that they are influenced by a range of social factors, including income and social status, social support networks, education and literacy, employment and working conditions, and social and physical environments (Andderson et al 2005, Berkman et al 200). Second, business and government replaced the individual as the principal purchasers of health care, and have been increasingly interested in research that reveals disparities in health status, unequal access to treatment and variable quality of care. Managers and policymakers have challenged the view that entrenched health problems can be solved simply by more doctors, more medicines or faster discharge times. Third, fuelled by the repercussions of high-profile cases such as the Bristol Royal Infirmary (Dyer 1998) and Bundaberg Hospital (Van Der Weyden 2005) cases, cynicism grew about the medical profession's ability to put aside its own interests and to self-regulate standards of performance.

In light of such developments, it is no accident that doctors have been concerned with issues of professionalism. In February 2002, a transatlantic team of physicians published a Charter of Medical

Professionalism, which was a bold restatement of the responsibilities of doctors as professionals — a sort of modern Hippocratic Oath (Medical Professionalism Project 2002, American Board of Internal Medicine 2002). Thereafter Medical Councils are stressing on "professionalism" as a core competency. The concept of professionalism rapidly gained traction, and the Charter provided a road map. It offered three fundamental principles: primacy of patient welfare, patient autonomy and social justice/public roles. The first two were uncontroversial. Social justice/public roles is defined as advocacy for and participation in improving the aspects of communities that affect the health of individual patients. It implies responsibilities for public roles that redress social inequalities.

So both scientific evidence and the relationship between the medical profession, politics and the public are dynamic and inter-related. Most doctors now seem to accept that their expertise should include knowledge about social determinants of illness and access to care and that, even when they are not personally involved, it is important that the profession provides a responsible expert voice on such determinants in public debate. Third, public roles are most likely to gain traction among doctors when conceptualized as issues of care and compassion rather than as actions of justice and redistribution. Fourth, a double challenge lies ahead because, while contemporary professional standing may partly depend on public engagement, the effectiveness of such engagement depends, in turn, on how convinced the public is that the profession has its own house in order (Irvine 2007) And finally, conceptual clarity, realistic expectations and good role models are needed if clinicians are to engage effectively with important public concerns. Teaching about social determinants of health alone is insufficient. To use this information and be effective political agents, future health care professionals will need skills in advocacy and public participation (Gruen 2008).

Quality of Medical Education

Medical profession is directly associated with the life of human being. A little mistake can take life of an individual during diagnosis, treatment and rehabilitation. That is why a doctor must be professional in high/her dealing with human being. (S)He should be trained with high standards before and afterward (s)he deals with human being. The need for continuous learning as part of a doctor's professional career is evident. The best ways of introducing and nurturing this learning have been the subject of much controversy, and the quality of medical education at all levels is being questioned and debated in many countries. How to improve the effectiveness of basic medical education and subsequently doctors' continuous learning is possible only by understanding learning theory to medical education. Innovations in undergraduate medical education are influencing the whole spectrum of medical education. So too is the growing literature on adult learning and the doctor as learner. Clinical problem solving has been identified as the core activity of how doctors learn and keep developing their competence. Creating an environment that provides practitioners with opportunities to explore and understand the personal theories underpinning their own practice is crucial for continuous professional development at all stages (Holm 1998).

Although a division of medical education into stages—undergraduate, postgraduate, and continuing medical education (CME)-seems sound from a regulatory and legal perspective, there are no fundamental differences in the way people learn across the continuum. The student often is told what to learn, but the qualified doctor is responsible for directing his or her own (lifelong) learning. Most doctors work in teams with other doctors, other health professionals, and administrators. Successful functioning depends not only on the doctor but on the performance of the whole team. This multiprofessional team represents a complex learning system which must be reflected in the planning of CME.

The driving force among the outstanding doctors is "their pride in performance-a desire never to be (or to be seen as) professionally inadequate." Similarly, in the physician change study the desire to be more competent in the delivery of health care to patients was the key force for change; regulations had little impact. Strict legislative and regulatory measures are thus not likely to be an effective way of maintaining professional competence. Reliable and valid identification of those few doctors whose practice falls well below accepted standards requires well planned and rather expensive programs. These doctors undoubtably present a great challenge to the profession and to the licensing bodies (Holm 1998).

The most important issue in continuing medical education is the quality of the education programs on offer, not whether they are voluntary or mandatory. Although competence is often taken as an all embracing term, it is important to distinguish between competence and performance. What the doctor does in day to day practice (performance) does not always corresponds to what he or she is assessed as being capable of doing (competence). No simple and effective way of assessing doctors competence and performance has as yet been developed.

Keeping all these difficult situations in mind there is definite need of medical educaiton policy legislation and program.

THE INDIAN MEDICAL COUNCIL ACT, 1956; (PROFESSIONAL CONDUCT & ETHICS) & REGULATIONS, 2002

This Act provides constitution of the Medical Council of India (MCI) and the maintenance of a Medical Register for India and for matters connected therewith. The act was amended in 1964 and 1993 and 2001. It extends to the whole of India.

The Act provides power to form a council having a member from each state, each university, each state medical register and seven members elected from amongst themselves by persons enrolled on such

THE INDIAN MEDICAL COUNCIL (AMENDMENT) Act, 2010

This is the amendment of the Indian Medical Council Act, 1956. 3A. (*1*) On and from the date of commencement of the Indian Medical Council (Amendment) Act, 2010, the Council shall stand superseded and the President, Vice-President and other members of the Council shall vacate their offices and shall have no claim for any compensation, whatsoever. (*2*) The Council shall be reconstituted in accordance with the provisions of section 3 within a period of one year from the date of supersession of the Council under sub-section (*1*). Till that time the Board of Governors constituted under sub-section (*4*) shall exercise the powers and perform the functions of the Council under this Act. They will be not more than 7 members and who shall be persons of eminence and of unimpeachable integrity in the fields of medicine and medical education, and who may be either nominated members or members, *ex officio,* to be appointed by the Central Government, one of whom shall be named by the Central Government as the Chairperson of the Board of Governors. In place of "Council", the words "Board of Governors" were substituted; the Board of Governors shall—(*i*) exercise the powers and discharge the functions of the Council under this Act and for this purpose, the provisions of this Act shall have effect subject to the modification that references therein to the Council shall be construed as references to the Board of Governors; (*ii*) grant independently permission for establishment of new medical colleges or opening a new or higher course of study or training or increase in admission capacity in any course of study or training referred to in section 10A or giving the person or college concerned a reasonable opportunity of being heard as provided under section 10A without prior permission of the Central Government under that section, including exercise of the power to finally approve or disapprove the same; and (*iii*) dispose of the matters pending with the Central Government under section 10A upon receipt of the same from it. The Indian Medical Council (Amendment) Ordinance, 2010, is hereby repealed.

The Indian Medical Council Act, 1956 was enacted to provide for the reconstitution of the Medical Council of India and the maintenance of a Medical Register for India and for matters connected therewith. The Council's main function is to make recommendations to the Central Government in matters of recognition of medical qualifications, determining the courses of study and examinations required to obtain such qualifications, inspection of examinations and maintenance of register of medical practitioners, etc. Certain recent developments in the functioning of Medical Council of India affecting the standards of medical education, recognition of medical institutions, etc., have shaken the confidence of the general public in the functioning of the Medical Council necessitating urgent remedial measures. However, it is found that the Act does not contain any enabling provision for taking over the powers of the President of the Council or superseding the Council in case of necessity. It has, therefore, been considered necessary to entrust the affairs of the Medical Council of India to a Board of Governors consisting of eminent doctors till such time the Council is reconstituted or altogether a new body like the National Council for Human Resources in Health as an over arching regulatory body is established by suitable legislation. Some more time is required to examine and harmonize the different views, and come up with an implementable and feasible model that has the consensus of all stakeholders.

registers, eight members nominated by Central government. President and vice president of the Council elected by all members. Members has terms of five years who can be nominated or reelected. The council meets once in each year with at least 15 members as a quorum (Sec 8) to take important decisions, such as appointment of registrar, treasurer, executive committee or any other person necessary to carrying out the purpose of this Act (Sec 9).

No person shall open a new medical college or start any medical course or training or increase number of seats without prior permission obtained from the council. For such purpose, a scheme in accordance with Act should be submitted to council through central government (Sec 10). The central government may after considering the scheme and recommendation of the council, either approved (with conditions, if any) or disapproved the scheme (sec 10.4) within one year of submission of scheme. If no communication sent by the government, the scheme can be considered granted. Following factors (sec 10.7) need to be considered by granting permission: (a) able to offer the minimum standards of medical education, (b) financial resources, (c) necessary facilities-staff, equipments, accommodation, training, etc., (d) adequate hospital facilities, (e) arrangement for proper training to students, (f) professional manpower. The Committee of the council appoints number of medical inspectors to inspect any medical institution, college, hospital or other institution where medical education is given or examination conducted by the university for the verification of adequacy of standards to get the approval from Central government (Sec 17). The council may appoint number of visitors to perform the inspection for the purpose of granting recognized medical qualification (Sec 18). If such institution as unable to conform to the standards prescribed by the council, the Central Government may notify after given sufficient time for clarification.

Central government may notify the withdrawal of recognition of such medical qualification from the institution after given sufficient time for clarification (Sec 19). The council may prescribe the minimum standard of medical education required for granting recognized medical qualification by university or medical institution in India (Sec 19). The council may constitute a post graduate committee to set standards of postgraduate medical education (Sec 20). The council may prescribe standards of professional conduct and etiquette and a code of ethics for medical practitioners (Sec 20A).

The medical qualification granted by approved university or medical institution in India shall be recognized (Sec 11). The primary medical qualification granted by a medical university or institution outside India shall be recognized and person shall be enrolled on any state medical register, if such person is a citizen of India, and qualify the screening test in India (Sec 13.4.a), who has obtained eligibility certification.

The council appoints registrar to maintain a Indian Medical register (Sec 21) and may remove the name of medical practitioner on the grand of professional misconduct (Sec 24). The council is also empowered to give provisional registration to the citizen has qualification from institution outside India or want to get medical training before granting permanent registration (Sec 25). Person can get registration for additional qualification also (Sec 26). Any person who do not complying with any of the provision of Act, the government can appoint commission of 3 persons that investigate the case and recommends remedies (Sec 30). The council has powers to make rules (Sec 32) and regulation (Sec 33).

Enrolled medical doctor can held office as physician or surgeon, practice medicine in any state, entitled to sign or authenticate a medical or fitness certificate, entitled to give evidence at any inquest or in any court of law as an expert. Any person who contravene any provision of Act practice medium could be punished with imprisonment for a term, which may extend to one year or with fine which may extend to Rs. 1000 or with both.

Indian Medical Council (Professional Conduct, etiquette, and Ethics) Regulations 2002 specify following duties and responsibilities and various characteristics of physician:

1. Code of medical ethics

- Physician shall uphold the dignity and honor of his profession with prime objectives of rendering services to humanity and rewards or financial gains would be subordinate.

- No person with qualifications other than modern system of medicine (Allopathy) would be allowed to practice modern system of medicine.
- Physician should try continuously to improve medical knowledge and skills and should affiliate himself/herself with reputed allopathic organizations and attend continuing medical education Program, for at least 30 hours every five years.
- (S)he shall maintain the medical records of the patient for 3 years which may be made available whenever required. (S)he shall maintain a medical certificate register entering relevant information about the person for which certificate has been issued.
- Physician shall display the registration number in his/her clinic and on every prescription, certificate, etc. (S)he shall display as suffix to his/her name only recognized degree, diploma, memberships, and honor. (S)he shall prescribe rationally only generic names of drugs. Physician should also display his fee in his/her chamber. Physician should announce his/her fees before rendering service and not after the operation or treatment is underwent.
- (S)he should be cooperative in observance and enforcement of sanitary laws and regulations in the interest of public health. A physician should observe the provision of the state Acts like Drugs and Cosmetic Act 1940, Pharmacy Act 1948, Narcotic Drugs and Psychotropic Substance Act 1985, Medical Termination of Pregnancy Act 1971, Transplantation of Human Organ Act 1994, Mental Health Act 1987, Environmental Protection Act 1986, Prenatal Sex Determination Test Act 1994, Drugs and magic Remedies (Objectionable Advertisement) Act 1954, Persons with Disabilities (Equal Opportunities and Full Participation) Act 1995, and Biomedical Waste (Management and Handling) Rules 1998, etc.

2. Duties of physician to their patients

- in case of emergency a physician must treat the patient otherwise he/she may refuse treatment and refer the patient to another appropriate physician. Confidence concerning individual or domestic life entrusted by patients to a physician and defects in the disposition or character of patients observed during medical attendance should never be revealed unless their revelation is required by the law. Physician should also determine whether his/her duty to society requires him/her to communicate to the society about patient confidential information.
- (S)he should neither exaggerate nor minimize the gravity of a patient's conditions and tell the patient or relatives.
- (S)he shall be punctual in consultation; shall treat best of his/her knowledge; shall avoid unnecessary consultation and always do benefit to patient; shall refer to specialist if required; etc.

3. Duties of physician in consultation

- physician can get consultation only when it is justifiable and in the interest of the patient. Laboratory tests of any kind shall be carried out judiciously. Consultant should observe utmost punctuality and will never try to blame the treating physician or disclose any diagnosis in front of patient or his/her relatives without discussion with treating physician. When a patient is referred to a specialist by the attending physician, a case summary of the patient should be given, who should communicate his opinion in writing to the attending physician.

4. Responsibilities of physicians to each other

- (S)he should consider it as a pleasure and privilege to render grateful service to all physicians and their immediate family dependents. There should not be any discussion in the presence of patient or his/her representatives which may affect the confidence of the patient in the treating physician. No physician or consultant shall criticize the referring physician. Whenever another physician treats the patient during the absence of his/her physician, utmost consideration to the interests and reputation of the absent physician should be made.
- Physician shall render gratitude service to all physician and their immediate family dependents.

5. Duties of physician to the public and to the paramedical profession

- Physician, who is engaged in public health work, should enlighten the public concerning quarantine regulations and measures for the prevention of epidemic and communicable diseases. At all times the physician should notify the constituted public

health authorities of every case of communicable disease under his care, in accordance with the laws, rules and regulations of the health authorities.

- Physician should recognize and promote the practice of different paramedical services and should seek their cooperation whenever required.

6. Unethical Acts & Misconducts

- Any violation of code of conduct, unethical act or misconduct shall lead to removal of his/her name from the register permanently or temporarily and shall publicize the name of physician in local press as well as in the publications of different medical associations/societies/bodies. Professional misconducts or infamous conducts, are given below:
- Advertisement: media, sign boards, cuts or fee display,
- Association: drug companies-gifts, laboratories-commission, colleagues-cut back, employer-fee splitting,
- Alcoholism,
- Adultery,
- Abortion conducted by self without sufficient training and qualification and helping some other who is not qualified,
- Human rights violation by inflicting mental or physical trauma or concealment of torture,
- Conviction by Court for moral turpitude,
- Certificates to unqualified false, improper, or misleading person, or fact,
- Contravention of Drugs Act,
- Prescribing or dispensing secret remedies,
- Breach of patient confidence without any genuine reason to do so,
- Not taking proper and appropriate written consent for operation or whenever the procedure may endanger his/her life,
- Claiming to be specialist without recognized qualification or experience
- Violation of existing ICMR guidelines while conducting medical research
- Found absent on more than two occasions during inspection carried out by the head of the district health authority or chairman, Zila Parishad, and
- Found absent on more than two occasions from the medical college/institution wherever both teaching faculty or other specialists are posted.

MEDICAL PROFESSIONAL OATH

1. I solemnly pledge myself to consecrate life to the service of humanity.
2. Even under threat, I will not use my medical knowledge contrary to the laws of humanity.
3. I will maintain the utmost respect for human life from the time of conception.
4. I will not permit considerations of religion, nationality, race, party politics or social standing to intervene between my duty and my patient.
5. I will practice my profession with conscience and dignity.
6. The health of my patient will be my first consideration.
7. I will respect the secrets which are confined to me.
8. I will give to my teachers the respect and gratitude which is their due.
9. I will maintain by all means in my power, the honor and noble traditions of medical profession.
10. My colleagues will be my brothers.

I make these promises solemnly, free and upon my honor.

Current status of Manpower and Infrastructure

As on Dec 2009 there are 300 medical colleges in the country out of which 223 medical colleges have been recognized under Section. The remaining 77 medical college have been permitted for starting MBBS course. Admission capacity of these colleges is approx. 34690 students per year.

THE INDIAN NURSING COUNCIL ACT, 1947

This Act is aimed to regulate uniform standard of training for nurses, midwives and health visitors. It extend to whole of India except the State of Jammu & Kashmir. This council is composed of 24 members from different departments - Indian Medical Council, Trained Nurses Association, DGHS, Chief Principal Matron, Chief Nursing Superintendent, Chief Administrative Medical Officer. Among these members president,

vice-president and other officials are elected. At present 774 general nursing and midwifery schools, 250 auxiliary nurse midwifery schools, 268 colleges of nursing for conducting graduation courses and 42 colleges for conducting Postgraduate courses in nursing are functioning in the country. On an average 15-20 thousand nurses and 10-12 thousand auxiliary nurse midwives qualify every year. So far (Dec 2008), 1043363 nurses and 5,57,022 Auxiliary Nurse Midwives and 51776 health visitors have been registered with various states' nursing councils.

Any person may enroll in register who has recognized qualification. Any Indian person who has got foreign degree may enroll temporary in the state register for employment in particular hospital/institution only for a particular period.

Any institution which is engaged in training, and distribution of nursing diploma or degree have to submit information from time to time. Such institutions shall be examined and inspected by the persons appointed by the executive body of council for the purpose of adequacy of training and examination.

Such inspecting body shall submit a report that the institution has not adequate resources and has not maintained standards then council may withdraw the recognition. The recognized institutions are notified in the official gazette.

According to the information available, 1820 general nursing and 491 midwifery schools, 1070 colleges are conducting graduation and 171 colleges are conducting courses for PG in the country as on Sept 2009.

THE DENTISTS ACT, 1948
(Amended in 1993) [16 of 1948]

The Act has main objective of regulating standard of dental education, dental profession and dental ethics in the country and also recommend to the Government of India to accord permission to start a dental college, start higher education, and to increase seats for students in a dental college.

The Act defined following terms: **Dental Hygienist** is described as a person who scales, cleans and polishes teeth or give instruction in dental hygiene. **Dental mechanic** is the person who makes or repair denture or dental appliances. **Dentistry** includes performance of any operation and treatment of disease of jaw or teeth, performance of radiographic work, anesthesia, artificial denture, etc. **Dentist** is the person who practices dentistry.

The Act authorizes the council to give recognition to any degree or diploma in dentistry obtained from India or from foreign countries. The Council registers dental hygienist and dental mechanics who have completed prescribed period of training and education. For registration of dental hygienists, mechanics, and dentists, the registers are maintained. The Council appoints an inspector who may inspect any dental college and submit a report which may lead to action and even cancellation of registration of college.

No person shall establish an authority or institute to conduct a course of study or training or receiving degree or diploma and shall be recognized until it is permitted by the Central Government in accordance with the provision of this Act (10A, 10B, 10C). The Act authorizes state governments to constitute state level councils for the fulfillment of the objective.

False registration or misuse of title during practice is taken as crime and punishable. Name can be removed from the register in case of suppression of fact, or for infamous conduct, or false registration. Commission of inquiry can be held by 3 persons appointed by Central Government including one judge from the high court. Punishment may be fine up to Rs. 500 to Rs. 1000 or imprisonment up to 6 months or both. There are 55,058 registered dentists (BDS) in the country and 185 dental colleges with an annual capacity of about 13,240 students every year.

Dentist (Code of Ethics) regulations, 1976 was notified in which duties and obligations of dentists towards patients and public, towards one another and unethical practices are specified.

THE PHARMACY ACT, 1948
(Amended in 1976)

This is an Act to regulate the profession of pharmacy and to make better provision for the regulation of the profession and practice of pharmacy and for that purpose to constitute Pharmacy Council of India. The Central Government shall constitutes a Central Council consisting of the following members for 5 years from the teacher groups, the Central Government, the Medical Council of India, the Director General, Health Services, the Drugs Controller, the Director of the Central Drugs Laboratory, the University Grants Commission, All India Council for Technical Education, and State Councils. Similarly, the State government can make State Council (Sec 19). The Central Council shall make the Education Regulations prescribing the minimum standard of education for the pharmacist.

Any authority in the State, which conducts a course of study for pharmacists may apply to the Central Council for approval and if satisfied shall declare approved. The authority has to apply for holding an examination in pharmacy and Central Council, if satisfied according to conformity with the Education Regulations, shall declare the said examination (Sec 12). Any failure in fulfilling the requirement may attract withdrawal of approval (Sec 13). The Central Council, if satisfied may grant approval for the Indian who has obtained any qualification outside the territories of the Act (Sec 14).

The Central Council shall maintain a register of pharmacists (the Central Register). The Executive Committee may appoint inspectors for the purpose of inspection or examination to any institution. He shall report on the sufficiency of every institution or examination (Sec 16). The Central Council may make regulations consistent with this Act to carry out the functions (Sec 18).

A person who has attained the age of eighteen years shall on payment of the prescribed fee be entitled to have his name entered in the register or renew if he resides or caries on the business or profession of pharmacy in the State and if he satisfies the conditions prescribed with the prior approval of the Central Council or state council (Sec 32).

The name of any person who is convicted for infamous conduct or found guilty or produced false statement or suppressed material fact shall be removed (Sec 36). Restoration of name in register can be made after sufficient evidence of innocence (Sec 37).

If any person whose name is not in the register of the State Falsely pretends shall be punishable on first conviction with fine which may extend to five hundred rupees and on any subsequent conviction with imprisonment extending to six months or with fine not exceeding one thousand rupees or with both (sec 41).

At present, there are 461 approved institutions imparting Diploma in Pharmacy 27,735 students per annum and 261 approved institutions imparting Degree in Pharmacy to 14,790 students per annum.

THE REHABILITATION COUNCIL OF INDIA ACT, 1992

The Act is aimed to regulate the training of rehabilitation professionals and the maintenance of a Central Rehabilitation Register. The Act identifies recognized qualification granted by the University, etc., in India and outside India (Secs. 11,12). A person possessing the qualification has certain rights and can practice rehabilitation (Sec 13). The Act regulates the standard of education, training and examination (Secs 14, 15).

Recognition of the Institution can be withdrawn if it does not fulfil requirements as specified in the Act (Sec. 17). The Council shall maintain a register bearing the names of professionals who have got registered. In case of infamous conduct and any illegal practice done by the person may cause the removal of his name from the register (Sec 21). The Act has scope for further improvement in rules and regulation (Secs 29, 30).

THE INDIAN MEDICINE CENTRAL COUNCIL ACT, 1970

The Central Council of Indian Medicine is a statutory Body constituted and reconstituted in 1984 and 1995 under the Act. The main objects of the Central Council are as follows:

1. To prescribe minimum standards of education in Indian System of Medicine viz Ayurved. Siddha and Unani Tibb.
2. To recognize and the withdrawal of recognition of medical qualification in Indian Medicine if standards are not met.
3. To maintain the central register of Indian medicine and revise the register from time to time.
4. To prescribe standards of professional conduct, etiquette and code of ethics to be observed by the practitioners.
5. To prepare and draft uniform curriculum and syllabus for undergraduate and postgraduate education in these systems of medicine.

Ayurveda System of Medicine

Ayurveda (Ayu+veda) means the "science of life". The documentation of Ayurveda is referred to in Veda the oldest text of Hinduism. The origin of Ayurveda is linked with comprehensive documentation of various facts about disease and medicine in Charak Samhita and Sushruta Samhita. According to Ayurveda, health is considered a pre-requesite for achieving the goals of life, i.e., dharma, artha, kama and moksha. Ayurveda takes an integrated view of the physical, mental and spiritual and social aspects of human beings, each impinging on the others. The philosophy is based on the theory of Panchmahabhutas (Five elements) of which all the objects and living bodies are composed of. The combination of these five elements are represented in the form of Tridosha, viz. Vata (ether+Air), Pitta (Fire) and kaph (water + Earth). These three 'Doshas" are physiological entities in living beings. These are also known as three humors. The mental, spiritual and physical attributes are described as Satva, Rajas, and Tamas. Any imbalance due to internal and external factors causes disease and restoring the equilibrioum through various techniques, procedures, regimens, diet and medicine constitute the treatment.

The treatment has two components: Preventive and curative. Preventive aspect is called Svasth-Vritt and includes personal hygiene, regular daily routine, appropriate social behavior, and rashyana sevana i.e., use of rejuvenative mateials/food and rasayans drugs. The curative treatment consists of three major categories of procedures Aushodhi (drugs), Anna (diet), and Vihara (exercise and general mode of life).

Siddha System of Medicine

Siddha means 'achievement' and siddhars were saitly persons who achieved result in medicine. Siddha literature is in Tamil and it is practised in Tamil speaking parts of India and abroad. Identification of causative factors through the examination of pulse, urine, eyes, study of voice, color of body, tongue and the status of the digestive system. The siddha system of medicine emphasises that medical treatment is oriented not merely to disease but has to take into account the patients environment, the meteorological consideration, age, sex, race, physical condition, physiological constitution, etc. This means the treatment has to be individualistic which ensures lesser chance of committing mistakes in diagnosis or treatment.

Unani System of Medicine

Unini System of Medicine originated in Greece and passed through many countries. This sytem emphasises on the use of naturally occuring, mostly herbal, medicines and also uses few medicines of animal, marine and mineral origin. This system of medicine was documented in Al Qanoon, a medical bible, by Sheikh Bu-Ali Sina (Avicena 980-1037 AD), and in Al-Havi by Razi (850-923AD). This system is based on the humoral theory i.e. presence of blood, phlegm, yellow bile and black bile. The temperament of the person is according ly expressed as sanguine, phlegmatic, choleric and malancholic. According to the Unani theory, the humors and medicines themselves are assigned temperament. Any change in quantity and quality of humors, brings about a change in the status of health of human body. Balance is the status of health of human body. Balance is required in humaors for maintenance of health. The treatment comprises three components-preventive, promotive and curative. For prevention of disease and promotion of health, the Unani system emphasises on six essentials-pure air, foor and water, physical movement and rest, psychic movement and rest, sleep and wakefulness and

retention of useful materials and evaluation of waste materials from the body.

THE HOMEOPATHY CENTRAL COUNCIL ACT, 1973

This is an Act to provide for the constitution of a Central Council of Homeopathy and the maintenance of a Central Register of Homeopathy and for matters connected therewith. It extends to the whole of India (Sec 1). The Central Government shall constitute Central Council of Homeopathy consisting elected members from registered qualified members, representative from university and faculty (Sec 3, 4, 5). The President, Vice-President or a member of the Central Council shall hold office for a term of five years (Sec 7).

Any University, Board or other medical institution in India which grants a medical qualification not included in the Second Schedule may apply to the Central Government to have any such qualification recognized, and the Central Government, after consulting the Central Council, may, by notification in the Official Gazette, amend the Second Schedule so as to include such qualification (Sec 13). Person qualified from medical institutions outside India given in third schedule will be registered (Sec 14).

No person shall practice Homeopathy unless possesses a recognized medical qualification and is enrolled on a State Register or the Central Register of Homeopathy. He/she is entitled to sign or authenticate a medical or any court of law fitness certificate or any other certificate required by any law and shall be entitled to give any evidence at any inquest on any matter relating to Homeopathy. It is the duty of Registrar to maintain the Central Register of Homeopathy (Sec 21).

Any person who acts in contravention of any provision shall be punished with imprisonment for a term, which may extend to one year or with fine, which may extend to one thousand rupees, or with both (Sec 16).

The Central Council shall appoint medical inspectors to inspect any medical college, hospital or other institution where education in Homeopathy is given, or to attend any examination held by any University, Board or medical institution (Sec 17) who shall report on the adequacy of the standards of education including staff, equipment, accommodation, training and other facilities prescribed by the Central Council (Sec 20). On the basis of report or inspector or visitor the central council may withdraw recognition (Sec 18).

Homeopathy practitioner obeys the professional conduct prescribed by the Central Council and for any violation or misconduct shall lead to removal of names from the central register. On receipt of report or complaint the Central Government can set up a Commission of inquiry against Central Council (Sec 30). If the Central Council fails to comply with norms and standards, the Central Government may amend the regulations of the Central Council on the basis of recommendations of the commission. The Central Government may make rules (sec 32) and regulation (Sec 33) to carry out the purposes of this Act (Sec 32). Dr. Christian Friedrich Samuel Hahnemann (1755-1843) observed that certain substances could produce symptoms in healthy individual and he experimented extensively various substances in difference doses in various diseases.

The first principle similia similibus curentur, states that a medicine, which can induce a set of symptoms in healthy human beings, would be capable of curing the similar set of symptoms in disease state. In modern terminology it is known as Human Drug Pathogenicity study (Drug proving). The second principle of single medicine, advocates one medicine at a time for a particular patient during the treatment. Third principle minimum dose advocates use of least potent dose of the drug, which would provide full and copmplete cure without any side effects. Homoeopathy also believes that the causation of a diseae mainly depends upon the susceptibility or proneness of an individual to the incidence of particular disease in addition to external agents, namely, bacteria, viruses, etc. The treatment stresses on individual's response to the specific environment. It is individual person who is treated in homoeopathy. Drugs are prepared from natural sources-vegetables, minerals, animal, etc. There is no toxic or poisonous effect in these medicine since it is not the chemical or physical properties that are acting on the human system.

INDIAN MEDICINE & HOMOEOPATHY PHARMACY COUNCIL BILL, 2005:

Under the Provision of this Act a center Council of Pharmacy and States Councils of Pharmacy are proposed to be established. Take care of uniformity in pharmacy in all states under different streams of medicine Council of Pharmacy are:

1. Maintenance of Standards of Pharmacy education in ASU&H
2. Maintenance of a Center Register of Pharmacist.
3. Recommendatory body to the Central Govt. for recognition of pharmacy qualifications awarded by institute of Universities.
4. To inculcate professionalism in the practice of pharmacy.
5. To make Regulation with prior approval of the Control Government.
6. Control and Canalizations of Pharmacists by giving institutional training and granting them registration.

THE DELHI NURSING HOMES REGISTRATION ACT, 1953

This is an Act to provide for the registration and inspection of nursing home in the state of Delhi. Nursing home means premises used or intended to be used for the reception of persons suffering from any sickness injury or infirmity and the providing of treatment and nursing for them and includes a maternity home, and the carry on 'nursing home' means to received persons in a nursing for any of the aforesaid purposes and to provide treatment or nursing for them. Every person intending to carry on a nursing home shall make every year an application for registration of renewal of registration to the supervising authority.

Various specifications of nursing home is given in Delhi Nursing Homes Registration (Amendment) Rules 1992. Fee for registration and renewal is Rs. 500/- for nursing homes with less than 10 beds. It is Rs 1000/- for nursing homes with 30 beds or less and More than Rs. 2000/- is for more than 30 beds. Building should comply with the relevant Municipal Bye-Law. A separate labor room and a separate operation theatre shall be provided with minimum floor space of 180 sq. ft. For intensive care unit facilities there should be at least 4 nurses provided exclusively for 4 such beds or fraction thereof and 2 doctors round the clock. One qualified doctor holding a degree round the close for every 20 beds or fraction thereof.

Penalty for non-registration-whoever contravenes the provisions of section 2 shall, on convection, be punished with fine which may extend to five hundred rupees, or in case a second or subsequent offence, with imprisonment for a term which may extend to three months or with fine which may extend to Rs. 500 or with both and such person do not get the permission to run the nursing home. Licence of Registered nursing home may be cancelled if owner/manager do not fulfil the requirement.

THE CLINICAL ESTABLISHMENTS (REGISTRATION AND REGULATION) ACT, 2010

This is an Act to provide for the registration and regulation of clinical establishments in the country and passed by the Parliament and assent on 18th August 2010. It is considered expedient to provide for the registration and regulation of clinical establishments with a view to prescribe minimum standards of facilities and services which may be provided by them so that mandate of article 47 of the Constitution for improvement in public health may be achieved.

This Act may be called the Clinical Establishments (Registration and Regulation) Act, 2010 (Art 1,1). It applies, in the first instance, to the whole of the States of Arunachal Pradesh, Himachal Pradesh, Mizoram and Sikkim and the Union territories; and it shall apply to such other State which adopts this Act by resolution passed in that behalf under clause (1) of article 252 of the Constitution.

"Clinical establishment" means:-
(*i*) a hospital, maternity home, nursing home, dispensary, clinic, sanatorium or an institution by whatever name called that offers services, facilities requiring diagnosis, treatment or care for illness, injury, deformity,

abnormality or pregnancy in any recognized system of medicine established and administered or maintained by any person or body of persons, whether incorporated or not; or

(*ii*) a place established as an independent entity or part of an establishment referred to in sub-clause (*i*), in connection with the diagnosis or treatment of diseases where pathological, bacteriological, genetic, radiological, chemical, biological investigations or other diagnostic or investigative services with the aid of laboratory or other medical equipment, are usually carried on, established and administered or maintained by any person or body of persons, whether incorporated or not,

And shall include a clinical establishment owned, controlled or managed by:-

(*a*) The Government or a department of the Government;
(*b*) A trust, whether public or private;
(*c*) A corporation (including a society) registered under a Central, Provincial or State Act, whether or not owned by the Government;
(*d*) A local authority; and
(*e*) A single doctor,

But does not include the clinical establishment owned, controlled or managed by the Armed Forces (Art 2). "Emergency medical condition" means a medical condition manifesting itself by acute symptoms of sufficient severity (including severe pain) of such a nature that the absence of immediate medical attention could reasonably be expected to result in-

(i) the health, serious jeopardy
(ii) serious impairment to bodily functions
(iii) serious dysfunction of any organ or part of a body

"Recognized system of medicine" means Allopathy, Yoga, Naturopathy, Ayurveda, Homeopathy, Siddha and Unani System of medicines or any other system of medicine as may be recognized by the Central Government;

The National Council For Clinical Establishments

Central Government shall established for the purposes of this Act, a council to be called the National Council for clinical establishments (Art 3). The National Council shall consist of-

(a) Director-General of Health Service, Ministry of Health and Family Welfare, ex, officio, who shall be the Chairperson;
(b) Four representatives out of which one each to be elected by the:
(i) Dental council of India constituted under section 3 of the Dentists Act, 1948
(ii) Medical Council of India
(iii) Nursing Council of India
(iv) Pharmacy Council of India

(c) Three representatives Central Council of Indian Medicine representing the Ayurveda, Siddha and Unani systems of medicine;
(d) One Central Council of Homeopathy;
(e) One Central Council of the Indian Medical Association;
(f) One Bureau of the Indian Standards constituted;
(g) Two representatives from the Zonal Council set-up;
(h) Two representatives of the North-Eastern Council
(i) One paramedical systems; (j) two National Level Consumer Group;
(k) One Associations of Indian Systems of Medicines;
(l) The Secretary-General of the Quality Council of India.

Nominated members of the National Council shall hold office for three years. National Council shall meet at least once in three months.

The National Council shall:-

(*a*) Compile and publish a National Register of clinical establishments within two years from the date of the commencement of this Act;
(b) Classify the clinical establishments into different categories;
(c) Develop the minimum standards and their periodic review;

Registration And Standards For Clinical Estabishmnets

Every State Government shall by notifications constitute a State Council for clinical establishments or the Union Territory Council for clinical establishments (Art 8)

The State Government shall, set-up an authority to be called the district registering authority for registration of clinical establishments (Art 10)

(*a*) District Collector – Chairperson
(*b*) District Health Officer – Convener
(*c*) Three members (Art 10).

No person shall run a clinical establishment unless it has been duly registered in accordance with the provision of this Act (Article 11). i.e. minimal standards (Art 12).

The clinical establishments shall undertake to provide within the staff and facilities available, such medical examination and treatment as may be required to stabilize the emergency medical condition of any individual who comes or is brought to such clinical establishment (Art 12.2). For the purpose of registration of an application in the prescribed proforma along with the prescribed fee shall be made to the authority (Art 14.1). If any clinical establishment is in existence within one year and for new establishment within a period of six months from the date of its establishment. The authority shall, within a period of ten days from the date of receipt of such application, grant to the applicant a certificate of provisional registration (Art 15), which shall be valid to the last day of the twelfth month shall be renewable (Art 17), shall be kept affixed in the establishment.

Application for permanent registration by a clinical establishment shall be made to the authority in such form and be accompanied by such fees (Art 24). The clinical establishment shall submit evidence of having complied with the prescribed minimum standards in such manner (Art 25). As soon as the clinical establishment submits the required evidence of having complied with the prescribed minimum standards, the authority shall cause to be displayed for information of the public at large and for filing objects (Art 26). If objections are received within the 30 days period shall be communicated to, the clinical establishment for response (Art 27).

The certificate shall be valid for a period of five years from the date of issue (30.2). The person entrusted with the management of the clinical establishment has been convicted of an offence punishable under this Act. If, the authority is satisfied that there has been a breach of any of the provisions of this Act or the rules made thereunder, it may, by an order, without prejudice to any other action that it may take against such clinical establishment, cancel its registration. The authority an officer authorized have the right to cause an inspection of, or inquiry in respect of any registered clinical establishments, its building, laboratories and equipment and also of the work conducted or done by the clinical establishment (Art 33.1). Provided that no such person shall enter the clinical establishment without giving notice of his intention to do so (Art 34). The authority shall within a period of two years from its establishment, compile, publish and maintain in digital format a register of clinical establishments called the National Register of clinical establishments.

Penalties

Whoever contravenes any provision of this Act shall, no penalty is provided elsewhere, be punishable for the first offence with fine which may extend to ten thousand rupees, for any second offence with fine which may extend to fifty thousand rupees and for any subsequent offence with fine which may extend to five lakh rupees (Art 40). Whoever carries on a clinical establishment without registration shall, on first contravention, be liable to a monetary penalty up to fifty thousand rupees, for second contravention with a monetary penalty which may extend to two lakh rupees and for any subsequent contravention with a monetary penalty which may extend to five lakh rupees (41.1). Whoever knowingly serves in a clinical establishment which is not duly registered under this Act shall be liable to a monetary penalty which may extend to twenty-five thousand rupees. While determining the quantum of monetary penalty, the authority shall take into account the category, size and type of the clinical establishment and local conditions of the area in which the establishment is situated.

Whoever willfully disobeys any direction lawfully given by any person or authority empowered under this Act o give such direction, or obstructs any person or authority in the discharge of any functions willingly withholding information which such person or authority is required or empowered under this Act to discharge, shall be liable to a monetary penalty which may extend to five lakh rupees (42.*1*). Deficiencies that do not pose any imminent danger to the health and safety of any patient shall be punishable with fine which may extend to ten thousand rupees.

Where an offence under this Act has been committed by a Department of Government and it is proved that the offence has been committed with the consent or connivance of, or is attributable to any neglect on the part of, any officer, other than the Head of the Department, such officer shall also be deemed to be guilty of that offence and shall be liable to be proceeded against and punished accordingly.

COMMENTS

The Clinical Establishments (Registration and Regulation) Act, 2010 is, perhaps, the most important public health legislation enacted so far with far reaching effects. For maximum benefits and uniform effects, ideally the Central Act should have been made applicable in all the states and union territories.

Old Act also requires to get registration of hospitals and nursing homes of allopathic system of medicine only. But new covers all systems and beside all dispensaries and clinics. Therefore Act should be applicable to whole India and not just few states. If other states do not accept the new Act and continue to have old Act then whole purpose of this legislation will be defected. District registraation authority should have some representation from other system of medicine also. Fear of inspector raj and undue harassment is another factor concers to private practitioners. Monitoring the compliance with standards by hundreds of thousands of establishments, clinics, nursing homes will require an army of officials. It will be difficult to ensure implementation of standards, which is known to be the weakest point. India enacts beautiful legislations but they remain mostly on paper because we are very poor in enforcement of legislations.

Maintenance of electronic health record (HER) and electronic medical record (EMR) of every patient as may be determined and issued by the Central or State Govt. It is a good idea, in principle, but a requirement, which is likely to be resented by the private clinics because of the added cost (of the system, software and the salary of the computer operator) as well as additional workload for busy clinicians. Besides, a large percentage of the physicians, especially those of the ISM (Indian Systems of Medicine), may not be computer savvy at all. This can be introduce in phase manner and government can give subsidies to buy equipment for the same.

Fear of Scrutiny: What is perhaps worrying the physicians more is the fear of scrutiny and exposure of their professional inadequacies, shortcuts, poor facilities, and mistakes as well as the harassment caused by the inspecting officials. So far hundreds of thousands of private clinics, even nursing homes, have been operating all over the country, unknown and hence not subject to any scrutiny / inspection / questioning by anyone. Since they are not known or registered, there is no check over their facilities or standards and many of them go on giving care and treatment of dubious quality, often in utter disregard of the rules and regulations. Their fear is that once registered, they would no more be able to hide from the legal and professional scrutiny.

Non-payment of medical bills of treatment of emergency cases is a point of serious and genuine concern of the medical community. The Act is silent on this aspect. The authorities concerned must redress the grievance to the satisfaction of medical professionals by putting in place a mechanism of ensuring problem free reimbursement of bills. The liability may be borne by the insurance agencies or by the government itself.

THE CONSUMER PROTECTION ACT (CPA), 1986

The CPA is a piece of comprehensive legislation and recognizes seven rights of the consumers, namely:

1. Right to safety,
2. Right to be informed,
3. Right to choose,
4. Right to be heard,
5. Right to seek redressal and
6. Right to consumer education.
7. Right to clean and healthy environment

Consumers with complaints can approach the Commissions at the District, State and Central level. There is no court fee and the consumer does not have to go through lawyers.

The Supreme Court declared that doctors were like any other providers of services under contract, and therefore are under the same obligation to compensate the purchaser (patient) for any deficiency in the quality of their services.

Under this Act, a complaint means any allegation in writing made by a complainant in regard to one or more of the following:

1. He has suffered a loss or damage as a result of any unfair trade practice adopted by any trader;
2. The goods/service mentioned in the complaint suffer from one or more defects.
3. A trader has charged for the goods mentioned in the complaint a price in excess of the price which is fixed by the law, displayed on the goods or displayed on any packet containing such goods.

Negligence means that "a person who holds himself ready to give medical advice and treatment implied undertakes that he is possessing the skill and knowledge for that purpose. Such a person, when consulted by a patient, owes him certain duties, namely a duty of care in deciding what treatment to give or a duty of care in the administration of that treatment. A breach of any of those duties gives a right of action for negligence to the patient."

Doctors in charitable clinics providing free service or government hospitals who are rendering free services are exempt from Consumer Protection Act. Doctors with independent practice, private hospital charging all, and hospitals with paying patients, doctors/ hospitals paid by an insurance firm/employer for treatment of a client, are liable for any negligence under the CPA.

What is not a "service" under CPA?

- Persons buying goods either for re-sale or for use in large scale profit making activity
- The government servants and the staff of the Accountant General Office of the Comptroller and Auditor General maintains the records of provident fund of government servants
- The insurance company is not a consumer.
- Medical services as "Contract of personal service"
- A lottery ticket holder is not "consumer"
- The student is a consumer of service of educational institute and undue delay of results is deficiency.
- A person who receives medical treatment in a Government hospital

There are central and state consumer protection councils with following objects:

(a) the right to be protected against the marketing of goods and services which are hazardous to life and property;

(b) the right to be informed about the quality, quantity, potency, purity, standard and price of goods or servicesso as to protect the consumer against, unfair trade practices;

(c) the right to be 'assured, wherever possible, access to a variety of goods and services at competitive prices;

(d) the right to be heard and to be assured that consumer's interests will receive due consideration at appropriate Fora;

(e) the right to seek redressal against unfair trade practices or restrictive trade practices or unscrupulous exploitation of consumers; and

(f) the right to consumer education.

If the Cost of the Services or goods and compensation asked for, is less than Rs. 5 lakh, then the complaint can be filed in the District Forum. If the cost is more than Rs. 5 lakh but less than 20 lakh, the complaint can be filed before the State Commission and for higher amount the complaint can be filed before the National Commission at New Delhi which shall decide the case within a defined period.

Where a trader or a person against whom a complaint is made or the complainant, fails or omits to comply with any order made by the District Forum, the State commission or the National Commission, as the case may be, shall be punishable with imprisonment for a term which shall not be less than one month but which may extend to three years or with fine which shall not be less than 2000 but which may extend to ten thousand rupees or both.

COMMENTS

Quality of health care service is a prime concern all over the world. Legislation is one important method of ensuring quality. That is why bring health services under CPA is welcome move of government. Ministry for Consumer Affairs, Food & Public Distribution, Government of India has instituted Swami Vivekanand National Award to encourage Voluntary Consumer Organization, Women and Youth for people's participation in consumer movement. Bureau of Indian Standards (BIS) has formulated quality standards for over seventeen thousands items. Five regional reference standards laboratories of weights & measures of central government have been operating in India under the Standards of weights & measures Enforcement Act 1985. Consumer awareness Programs has been operational through AIR, Doordarshan, and print media.

THE PATENTS ACT 1950

[As amended at dt. 4-4-2005]

The first Indian patent laws were promulgated in 1856. New patent laws were made after the independence in the form of the Indian Patent Act 1970. Amendment was made in 2005.

The Act defines "invention" as a new product or process involving an inventive step and capable of industrial application; "inventive step" means a feature of an invention that involves technical advance as compared to the existing knowledge or having economic significance or both and that makes the invention not obvious to a person skilled in the art; "new invention" means any invention or technology which has not been anticipated by publication in any document or used in the country or elsewhere in the world before the date of filing of patent application with complete specification, i.e. the subject matter has not fallen in public domain or that it does not form part of the state of the art; "patent" means a patent for any invention granted under this Act; "patent agent" means a person for the time being registered under this Act as a patent agent; "patented article" and "patented process" mean respectively an article or process in respect of which a patent is in force.

Novelty

An invention will be considered novel if it does not form a part of the global state of the art. Information appearing in magazines, technical journals, books, newspapers, etc. constitute the state of the art. An invention will cease to be novel if it has been disclosed in the public through any type of publications anywhere in the world before filing a patent application in respect of the invention.

Inventiveness (non-obviousness)

A patent application involves an inventive step if the proposed invention is not obvious to a person skilled in the art, i.e. skilled in the subject matter of the patent application.

Usefulness

An invention must posses utility for the grant of patent. The patent specification should spell out various uses and manners of practicing them, even if considered obvious.

Non-patentable inventions

An invention may satisfy the conditions of novelty, inventiveness and usefulness but may not qualify for a patent under the following situations:

1. An invention that is frivolous or that claims anything obviously contrary to well-established natural laws, e.g. different types of perpetual motion machines.
2. An invention whose intended use or exploitation would be contrary to public order or morality or that causes serious prejudice to human, animal or planet life or health or to the environment, e.g. a process for making brown sugar will not be patented.
3. The mere discovery of a scientific principal or formulation of an abstract theory, e.g. Raman effect and Theory of Relativity cannot be patented.
4. The mere discovery of a new form of a known substance that does not result in enhancement of the known efficacy of that substance or the mere discovery of any new property or new use of a known substance or the mere use of a known process, machine or apparatus unless such a known process results in a new product or employees at least one new reactant.
6. The mere arrangement or rearrangement or duplication of features of known devices each functioning independently of one another in a known way. If you put torch bulbs around an umbrella and operate them by a battery so that people could see you walking in the rain when it is dark, then this arrangement is patentable as bulbs and the umbrella perform their functions independently.
7. A method of agriculture or horticulture. For example, the method of terrace farming cannot be patented.
8. Any process for medical, surgical, curative, prophylactic, diagnostic, therapeutic or other treatment of human beings or any process for a similar treatment of animals to render them free of disease or to increase economic value or that of their products. For example, a new surgical technique for hand surgery for removing contractions is not patentable.
10. Discovery of any living thing or non-living substance occurring in nature.
11. Mathematical or business methods or a computer program per se or algorithms.
13. A presentation of information.
15. A mere scheme or rule or method of performing mental act or medical of playing games.

16. An invention which, in effect, is traditional knowledge or which is aggregation or duplication of a known component or components.

Protection of seeds and new plant varieties is covered under a different Act, which provides a protection for a period of 10 years.

Term of the patent

The term of the patent will be 20 years from the date of filing for all types of inventions.

Timing for filing a patent application

Filing of an application for a patent should be completed at the earliest possible date and should not be delayed. An application filed with provisional specifications, disclosing the essence of the nature of the invention, helps to register the priority by the applicant. A delay in filing an application may entail some risks, like (i) other inventors might forestall the first inventor by applying for a patent for the said invention and (ii) there may be either an inadvertent publication of the invention by the inventor himself/ herself or by others independent of him/her.

THE COPYRIGHTS ACT 1957

Copyright is a right that is available for creating an original literary or dramatic or musical or artistic work. Computer programs and software are covered under literary works and are protected in India under copyrights. The Copyright Act, 1957, as amended in 1983, 1984, 1992, 1994 and 1999, governs the copyright protection in India. The total term of protection for literary work is the author's life plus 60 years. For broadcasting, the term is 25 years from the beginning of the calendar year following the year in which the broadcast was made.

Infringement of copyright

Copyright gives the creator of the work the right to reproduce the work, make copies, translate, adapt, sell or give on hire and communicate the work to the public. Any of these activities done without the consent of the author or his assignee is considered infringement of the copyright. In other words, making one photocopy of a book for teaching students may not be considered an infringement, but making many photocopies for commercial purposes would be considered an infringement.

Transfer of copyright

The owner of the copyright in an existing work or prospective owner of the copyright in a future work may assign to any person the copyright, either wholly or partially, in the following manner.

References

Ackerknecht EA. Rudolph Virchow: doctor, statesman, anthropologist. Madison: University of Wisconsin Press, 1953.

American Board of Internal Medicine; American College of Physicians–American Society of Internal Medicine; European Federation of Internal Medicine. Medical professionalism in the new millennium: a physician charter. Ann Intern Med 2002; 136: 243-246.

Anderson MR, Smith L, Sidel VW. What is social medicine? Monthly Review [online] 2005; 56 (8). http://www.monthlyreview.org/ 0105anderson. htm (accessed May 2008).

Berkman L, Kawachi I, editors. Social epidemiology. New York: Oxford University Press, 2000.

Dyer C. British doctors found guilty of serious professional misconduct. BMJ 1998; 316: 1924.

Gazette of India. The Consumer Protection Act 1986. GOI.

Gazette of India. The Homeopathy Central Council Act, 1973 amended [Act No. 20 of 1983].

Gazette of India. Dentist Act, 1948 [16 of 1948].

The Gazette of India. The Clinical Establishments (Registration and Regulation) Act 2010. Extraordinary Part II – Section 1. New Delhi: Ministry of Law and Justice (Legislative Department) the August 19, 2010

Government of India. Annual report 2005-06. Min Health & Family Welfare, Govt of India 2006.

Gazette of India. The Indian Medicine Central Councel Act 1970.

Govt. of India. Annual Report 2005-06. MOHFW 2006.

Gazette of India. The Rehabilitative Council of India Act 1992.

Government of India. India 2005. Ministry of Information and Broadcasting, Govt of India 2005.

Gazette of India. Medical Council of India (Professional conduct, and ethics) Regulations 2002. Notification April 6th No. 14.

Gazette of India. The Pharmacy Act 1948 [Act No. 8 of 1948, amended in 1986, dated 4th. March, 1994].

Government of India. Annual report 2006-07. MoHFW 2007.

Gruen RL. Evidence-based advocacy: the public roles of health care professionals. MJA 2008; 188 (12): 684-685

Horton R. Violence and medicine: the necessary politics of public health. Lancet 2001; 358: 1472-1473.

Holm HA. Quality issues in continuing medical education. British Medical Journal, Feb 21, 1998.

Irvine DH. Everyone is entitled to a good doctor. Med J Aust 2007; 186: 256-261.

Medical Professionalism Project. Medical professionalism in the new millennium: a physicians' charter. Lancet 2002; 359: 520-522.

Tiwari R, et al. Management of Intellectual property Rights in India: An updated view. Journal of Natural Science, Biology and Medicine 2011; 2 (1): 2-12.

Van Der Weyden MB. The Bundaberg Hospital scandal: the need for reform in Queensland and beyond [editorial]. Med J Aust 2005; 183: 284-285.

CHAPTER 66

LEGISLATION RELATED TO CENSUS, BIRTH & DEATH

THE CENSUS OF INDIA 2001

INTRODUCTION

Census is an enumeration of a population, originally intended for purposes of taxation and military service. Ancient civilization such as the Roman conducted censuses. Now, it has many social, political, economic, or health advantages. Census enumeration of a population usually records identities of all persons in every place of residence, with age, or birth date, sex, occupation, national origin, language marital status, income and relationship to head of household in addition to information on the dwelling place. Many other items of information may be included, e.g., educational level (or literacy), and health related date such a permanent disability. A de facto census assigns according to their location at the time of enumeration. A de jure census assigns persons according to their usual place of residence at the time of enumeration.

The census of India 2001 can be termed as the Millennium Census because the new millennium has just began. The earliest references of census taking in India can be traced back to the Mauryan Period in Kautilaya's 'Arthshastra' and later during the Mughal period in 'Aian-e-Akbari'. First two censuses in 1865 and 1872 were conducted in nonsynchronous manner in different parts of the country. From 1881 onward censuses have been undertaken uninterruptedly once every ten year. The Constitution of India (Article 256) has made this exercise as mandatory for Union Government. The Census Act, 1948 forms the legal basis for conduct of censuses in independent India. The Census Organization has been set up under the Ministry of Home in 1961 which provides a vital continuity to conceive, plan and implement the program of census in the country. The organization is headed by the Registrar General and Census Commissioner, which has field offices in thirty States and Union territories. In states, the Directors of Census and Operations are responsible for census. However, newly developed states like Jharkhand, Uttrakhand, and Chattisgarh do not have their separate directors.

History of census

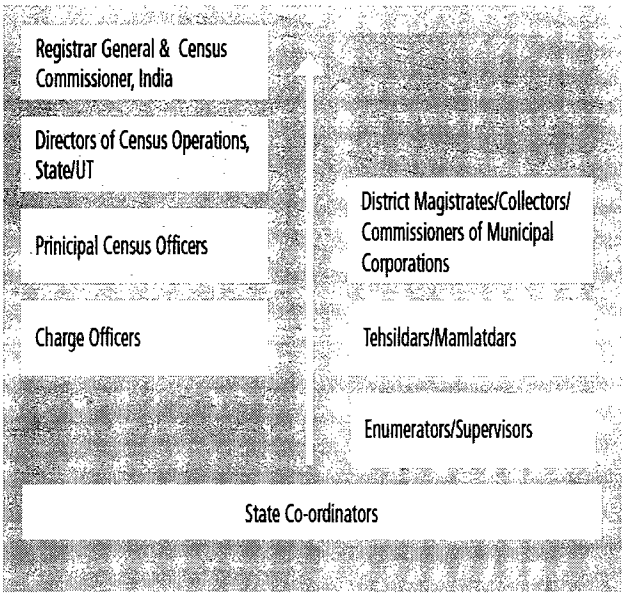
Mauryan period in Kautilaya's 'Arthashastra' (321-296 BC) there is a mention of enumeration of population. Mughal period in the writings of Abul Fazl (1595-96) in the 'Ain-e-Akbari' it was described that people were enumerated for getting taxes. Records have it that in 1687 during the Governorship of Elihu Yale in Madras Presidency, the King of England desired that a count of the inhabitants of Fort St George be taken. A count was also taken up in 1853 in the North Western Frontier, which was followed by a series of Census like enumerations. A systematic and modern population Census, in its present scientific form was conducted non synchronously between 1865 and1872 in different parts of the country.

Table 66.1: Comparison between 1991 and 2001 census

1. Population	846 million	1027 million
* Male %	51.8	51.7
* Female %	48.2	48.3
2. % Decadal Growth	23.8	21.3
* Bihar	23.5	28.4
* Kerala	13.9	09.4
* Tamil Nadu	14.9	11.2
3. Exponential Growth Rate	02.1	01.9
4. Population Density	273	+57
5. Sex Ratio	927	933
* Kerala (best)	1040	1058
* Haryana (Worst)	874	860
6. Literacy Rate %	52.2	65.4
* Male %	64.1	75.8
* Female %	39.3	54.2
* Kerala	90.5	90.9
* Mezoram	81.2	88.5
* Bihar	38.5	47.5

CENSUS 2011

Census 2011 is the 15th National Census of the country. This is the only source of primary data at village, town and ward level. It provides valuable information for planning and formulation of polices for



Central and State Governments and is widely used by National and International agencies, scholars, business people, industrialists, and many more. The delimitation/ reservation of Constituencies - Parliamentary/ Assembly/ Panchayats and other Local Bodies is also done on the basis of the demographic data thrown up by the Census. Census is the basis for reviewing the country's progress in the past decade, monitoring the on-going schemes of the Government and most importantly, plan for the future. That is why the slogan of Census 2011 is "Our Census, Our Future".

Table 66.2: Census Figures at Glance

Description	Male	Female	Total
Population (%)	532156772 (51.73)	496453556 (48.27)	1028610328 (16.8 of World)
Age group 0-6 (%)	81911041 (15.47)	75952104 (15.36)	157863145 (15.42 of Total Pop)
0-4 years	10.73	10.74	10.74
5-9 years	12.54	12.40	12.47
10-14 years	12.33	11.93	12.14
15-19 years	10.14	09.32	09.74
20-24 years	08.71	08.73	08.75
25-29 years	07.81	08.43	08.11
30-34 years	07.02	07.44	07.22
35-39 years	06.77	06.69	06.86
40-49 years	10.28	09.75	10.03
50-59 years	06.28	06.20	06.25
60-69 years	04.33	04.89	04.61
70-above years	03.04	03.19	03.12
Decadal Population *Growth (1991-01)*	91944020 (20.93)	88683339 (21.79)	180627359 (21.34)

Table 66.3: Distribution of States and Union Territories by various rates

1.	Uttar Pradesh	16.17	898	689	25.8	57.36
2.	Maharashtra	9.42	922	314	22.57	77.27
3.	Bihar	8.07	921	880	28.43	**47.53**
4.	West Bengal	7.81	934	904	17.84	69.22
5.	Andhra Pradesh	7.37	978	275	13.86	61.11
6.	Tamil Nadu	6.05	986	478	11.19	73.47
7.	Madhya Pradesh	5.88	920	196	24.34	64.11
8.	Rajasthan	5.50	922	165	28.33	61.03
9.	Karnataka	5.14	964	275	17.25	67.04
10.	Gujarat	4.93	921	258	22.48	69.97
11.	Orissa	3.57	972	236	15.94	63.61
12.	Kerala	3.10	**1058**	819	**9.42**	**90.92**
13.	Jharkhand	2.62	941	338	23.19	54.13
14.	Assam	2.59	932	340	18.85	64.28
15.	Punjab	2.37	874	482	19.76	69.95
16.	Haryana	2.05	861	477	28.06	68.59
17.	Chhatisgarh	2.03	990	154	18.06	65.18
18.	Delhi	1.34	821	**9294**	46.31	81.82
19.	Jammu & Kashmir	0.98	900	99	29.04	54.46
20.	Uttaranchal	0.83	964	159	19.20	72.28
21.	Himachal Pradesh	0.59	970	109	17.53	77.13
22.	Tripura	0.31	950	304	15.74	73.66
23.	Manipur	0.23	978	107	30.02	68.87
24.	Meghalaya	0.22	975	103	29.94	63.31
25.	Nagaland	0.19	909	120	64.41	67.11
26.	Goa	0.13	960	363	14.89	82.32
27.	Arunchal Pradesh	0.11	901	13	29.21	54.74
28.	Pondicherry	0.09	1001	2029	20.56	81.49
29.	Chandigarh	0.09	773	7902	40.33	81.76
30.	Mizoram	0.09	938	42	29.18	88.49
31.	Sikkim	0.05	875	76	32.98	69.68
32.	Andaman & Nicobar	0.03	846	43	26.94	81.18
33.	Dadra & Nagar Haveli	0.02	811	449	59.20	60.03
34.	Daman & Diu	0.02	**709**	1411	55.59	81.09
35.	Lakshadweep	0.01	947	1894	17.19	87.52

Table 66.4: Projected expectation of life at birth, Total Fertility Rate and projected population

Indices	1996-2001	2001-2006	2006-2011	2011-2016
Projected Population in million	1012.4	1094.1	1178.9	1263.5
Expectancy of life at birth	63.5	64.8		
Male	62.30	64.1	65.65	67.04
Female	65.27	65.8	67.67	69.18
TFR	3.13	2.88	2.68	2.52

OPERATIONS

The Census operations in India are carried out in two phases-the house numbering and the houselisting operations. Houselisting operation for the census was carried out in April-September 2000.

The population enumeration was undertaken between 9th to 28th February, 2001 (both days inclusive) with a revisional round from 1st to 5th March 2001. The census movement, the referral time at which the snapshot of the population is taken, was 0.00 hours of 1st March 2001. The Houseless population, as has been the usual practice, was enumerated on the night of 28th February, 2001. There were few exceptions in this enumeration because of adverse conditions prevailed in some states like Gujarat, Jammu & Kashmir, Himachal Pradesh, etc. Finally Census of India 2001 includes the data of 593 districts, 5564 tehsils/talukas, 5161 towns, and around 6.4 lakh villages.

The census enumerators and supervisors were mostly local school teachers, government staff, and employees of local bodies who were trained in advance and paid honorarium for this job.

To provide technical assistance to enumerators during enumeration in the field the census help lines were established. At the same time public could have registered their complaints on these help lines.

The Census of India 2001 has introduced many innovations including the form and contents of the houselist and household schedule, permanent location code number to the geographical area like village in any administrative unit, formation and also slum enumeration block, handling gender issues, post enumeration survey and wide publicity.

Findings of Census of India 2001

Comparative some of the findings are given table 66.1. It was found that India is second largest populated country (16.87) in the world after China (21.03%). The estimated global population in 2000 was 6055 million. China has much lower growth rate (1%) as compared to India (1.9%) during 1991-2001. Now Growth of India can be termed as High Growth with definite signs of slowing down. Certain definitions are accepted in the purpose of census such as person is considered **literate** when he/she is aged seven and above, can both 'read and write' with understanding in any language. Sex ratio is measured as number of females per 1000 males. Population density is number of persons per square km. Some of the Census numbers are given in table 66.2 and 66.3. Projected value of expectation of life at birth, Total Fertility Rate and projected population is given in table 66.4.

Reference

Govt. of India. Census of India 2001: Provisional Population Totals, Series -1. Registrar General & Census Commissioner Office, New Delhi.

THE REGISTRATION OF BIRTHS AND DEATHS ACT, 1969

Vital statistics are useful for socioeconomic development and health planning, population control program, and policies, etc. In India the vital statistics are generated through-Civil Registration System (Registration of Births and Deaths), Sample Registration System, Decennial population census, rural survey of cause of death, medical certification of causes of death from hospitals and health centers and Ad-hoc surveys conducted by the national and international research organizations.

The Registration of Births and Deaths Act was placed on the statute book in 1969 with the aim to collect and compile vital statistics which is necessary for planning and administration. Births and Deaths are the vital events in any population. Knowledge about these events is essential for the understanding of demography, health and civil needs. The Act has given statutory authority to the Registrar General, India to coordinate the work of civil registration throughout the country, usually the Director of Health Services is the Chief Registrar. However, in few states, Directors of Economic and Statistics are the Chief Registrars. In rural areas, the local registrars are mainly drawn from Panchayat, police, health or revenue departments. In Urban areas, Health Officers of the Municipalities or corporations, or the executive officers are the Registrars.

Every registrar has to registers births and deaths occurring within his/her administrative area. The information regarding occurrence is to be supplied within 21 days in both the events of deaths and births. Events not registered within prescribed time are registered as delayed events, on payment of prescribed fee if it is done within one month. In case of delay more than 30 days but within a year, an affidavit is required from a notary public or an officer for registration, besides late fee. For registration of events beyond one year, an order from class I officer/ magistrate is necessary.

Every Registrar is required to send periodical returns to the Chief Registrar who send their reports to the Registrar General, India. On the basis of the annual vital statistics returns received from the states, the Registrar General, India brings out a comprehensive annual report entitled, "Vital Statistics of India".

The Act provides for medical certification of cause of death. The enforcement of this is left to the state governments depending on the facilities available. A medical practitioner has to certify free of cost and in the prescribed format, the cause of death if he/she is attending the deceased during his last breath or illness.

COMMENTS

Registration data are deficient due to incomplete coverage and under registration. As monthly returns form the basis of compilation of data at the state level, the coverage of areas and population becomes incomplete if the monthly returns from some of the units are not available for compilation at state headquarter. This is mainly due to wide scattered distribution of villages where majority of population is illiterate who do not understand the importance of registration of every event. Village chawkidar should report all deaths but he is not aware of any birth taking place for sometime and late reporting of people for vital events is not so simple. The lengthy procedure of late reporting discourage the people to report all the events. In urban areas the reporting of birth and death has improved due to compulsory requirement at the time of admission in school in case of birth and transfer of property in case of death. However, still birth, accident deaths or death of old aged women who do not have any property do not attract attention of family member to get it registered. Such are few important reasons for not reporting vital event to the system.

Recently the work of registration and giving certificate of births and deaths is given to Panchayat who do not have any experience of such work. But doing this there is no surety of quality and authenticity of data collection. One can get birth registered of any age if surpunch can be obliged.

Reference

The Gazette of India. The registration of Birth and Death Act 1969. Govt. of India.

CHAPTER 67

LEGISLATION RELATED TO CONTROL OF EPIDEMICS

THE EPIDEMIC DISEASES ACT, 1897

Epidemic is the occurrences in a community or region of cases of an illness, specific health - related behavior, or other health related events clearly in excess of normal expectancy. There are various forms of epidemic. Infectious disease epidemic always cause threat to the community and need to be control.

The Act provides power to exercise for the control and to prevent any epidemic or spread of epidemic in the states or country. The states may authorize any of its officers or agency to take such measures if the state feel that the public at large is threatened with an outbreak of any dangerous epidemic (Sec.2). Person who is inspecting, is empowered to determine the process and authority to take responsibility of all expenses incurred in compensation, traveling, temporary accommodation, segregation of infected person, etc. The State government can authorize the District Magistrate or officials who can take any number of vehicles needed for carrying man and equipments to and fro or transporting infected persons during the epidemic or in threat of epidemic. It is the responsibility of state to deliver the vehicle in good shape and pay the appropriate compensation to the owner. State or central government may take measures and prescribe regulations for the inspection of any ship or vessel leaving or arriving at any port in the territories. Violation of any of the provisions of this Act is punishable under Sec 188 of the IPC. Over a period of time India has witnessed many epidemics and pandemics. This Act has been revoked particularly in H1N1 pandemic recently. It is realized that there is need to expand the scope of this Act including disease prevention and control. This Act should be repealed with more comprehensive Public Health Act.

MAHARASHTRA PREVENTION OF THE INFECTION & SPREAD OF EPIDEMIC DISEASE (PLAGUE) REGULATION, 1994

The regulations deal with, inter-alia, the notification of infected or threatened areas (Reg. 3), the publication of a list of infected or threatened towns and villages (Reg.5), the powers of district magistrates to ban entry to infected areas (Reg. 6), the notification of rat mortality and plague cases (Reg. 7), and powers of Plague Controlling Officers (Reg. 8-11). Regulation 8 lay down provision governing, inter-alia: the reporting of person arriving from infected areas, the detention, for a 24 hrs period, of persons conveying clothes, bedding, or articles from infected areas, pending the disinfection of such clothes, bedding, or articles; the removal of person suffering from plague to the infectious disease hospital and segregate for a 10 days observation period of person coming in contact with

such persons; the medical examination and segregation of person for 10 days, the disinfection of public vehicles arriving and departing from infected areas; the disinfection of train coming from infected areas; and the evaluation of infected building or premises. Reg. 9,10,11 empower plague controlling officer to: remove/ close markets/ fair, occupying vacant land or building dwelling etc. Reg. 12 deals with the removal of infected passenger from public transport.

INDIAN AIR CRAFT (PUBLIC HEALTH) RULES, 1954
(Amended in 1969)

These rules are framed by the Government of India as per the power given in the Aircraft Act 1934. These rules have described the following terms:
Health officer-means in respect of an airport in India any person appointed by the Central Government to the health office of the airport;
Infected aircraft-means an aircraft which has any person or animal who carries an infectious disease;
Infected area-in relation to a quarantinable or other infectious disease means any area outside India, declared by the Central Government, by notification in the official Gazette;
Isolation is applied to a person or group of persons means the separation of that person or group of persons from other persons, except the health staff on duty, in such a manner as to prevent the spread of infection.

Period of incubation-means (a) in respect of a quarantinable disease mentioned below, the period specified against it:-

Yellow fever	6 days
Plague	6 days
Cholera	5 days
Small pox	14 days
Typhus	14 days
Relapsing fever	8 days

At the time of arrival of aircraft following measures are taken by the health officer:

- When an infected or suspected aircraft coming from a place outside India, the health officer may take the appropriate measures as prescribed by the rules. He may consider medical examination or inspection of any passenger or crew on his/her arrival at the airport particularly when it comes from a yellow fever infected areas. When the aircraft comes from the area where malaria or other mosquito-borne disease could develop from imported vectors, the aircraft may be disinfected. All actions a health officer has to take in relation to the yellow fever, plague, cholera, typhus and relapsing fever have been described.
- An aircraft shall be regarded as infected with an infectious disease other than quarantinable disease, if it has a case of any infectious diseases on the board.
- Except in case of emergency, an aircraft shall not on account of an infectious disease other than quarantinable disease, be prevented by the health officer for loading cargo, stores, taking on fuel or water.

At the time of departure, passengers and crew should be certified by the health officer for their medical fitness. In case of pilgrim aircraft all persons should produce valid certificates of vaccination against cholera and yellow fever.

No person shall bring into India any dead body or human remains of persons who may have died of yellow fever, plague, anthrax, ganders or such other diseases as may be notified by the Central Government for this purpose. If such body is properly cremated then ashes shall be placed in an urn or casket having an outer packing of suitable material may be brought to India. There are specification for bringing un-cremated remains.

No person shall throw or let fall from any aircraft any matter capable of producing an outbreak of a quarantinable or an infectious or any other epidemic disease. Whoever contravene any provision of these rules may be punished for a term not exceeding three months or with fine which may extend to one thousand rupees or with both. The Indian Air Craft (Public Health) Rules need revision considering the recent modification adopted in International Health Regulation.

References
Inter Digest Health Legislation 1998; 49 (2): 297-450.
The current India status 1994 Jan-Dec., pp.108-113.

CHAPTER 68

LEGISLATION RELATED TO TOBACCO AND DRUGS CONTROL

THE CIGARETTES AND OTHER TOBACCO PRODCUTS ACT, 2003 (PROHIBITION OF ADVERTISEMENT AND REGULATION OF TRADE AND COMMERCE, PRODUCTION, SUPPLY AND DISTRIBUTION)

Tobacco is universally regarded as one of the major public health hazards and is responsible directly and indirectly for high morbidity and mortality. It has also found to be the cause of loss to economy due to tobacco related diseases and illnesses. The need for a comprehensive legislation to prohibit advertising and regulation of production, supply and distribution of cigarettes and tobacco products was recommended by the Parliamentary Committee of Subordinate Legislation (10th Lok Sabha).

This movement against tobacco has been started long time back when in 39th World Health Assembly on 15th May 1986, WHO urged the member states to implement all measures to ensure that effective protection is provided to nonsmokers from involuntary exposure to tobacco smoke and to protect pregnant women and children from exposure. This was further emphasized in 43rd World Health Assembly on 17th May 1990 that all member states must plan the strategies to curb the problem of tobacco.

In conformation of this the Parliament of India notified and enforced on 18th May, 2003 "The Cigarettes and other Tobacco Products (Prohibition of advertisement and regulation of trade and commerce, production, supply and distribution) Act, 2003 (34 of 2003) that is applied to whole India. Section 3 defines - cigarettes, tobacco products, smoking in "public place", "advertisement", etc. Advertisement includes any visible representation by way of notice, circular, label, wrapper or other document and also includes any announcement made orally or by any means of producing or transmitting light, sound, smoke or gas. Public place means any place to which the public have access, whether as of right or not, and includes auditorium, hospital buildings, railways waiting room, amusement centers, restaurants, public offices, court buildings, educational institutions, libraries, public conveyances and the like which are visited by general public but does not include any open space; Restaurants or hotels are included which have more than thirty rooms or seating capacity of thirty persons or more should have a separate provision for smoking area or space (sec 4). Tobacco products and production means cigarettes, cigars, cheroots, bidis, pipe tobacco and hooka tobacco, chewing tobacco, snuff, Pan masala or any other chewing material having tobacco, Gutka and tooth powder containing tobacco (Sec 3, and Schedule).

No person shall advertise, shall cause to advertise, shall take part in any advertisement directly or indirectly any tobacco product or cigarette for consumption or use (Sec 5); neither under a contract or otherwise

promote or agree to promote the use of consumption of cigarette or tobacco product or any trade mark or brand name of cigarettes or any other tobacco product in exchange for a sponsorships, gift, prize, or scholarship given (Sec 5 [3]). No person shall sell, permit sale of cigarette or tobacco product to children below 18 years or in a area within a radius of one hundred yards of any school, college or educational institution (Sec 6).

Every package of cigarettes or any other tobacco products produced, supplied or distributed should have label, pictorial depiction of skull and cross bones and other prescribed warning and the nicotine and tar contents on each cigarette with the maximum permissible limits (Sec 7 [1,5]). Warning signs and Labels should be prominent or as prescribed by rules and in English or any other Indian language (Sec 8, 9). Central government shall notify the testing laboratory for the estimation of nicotine and tar content (Sec 11). Power of entry and search of any building, factory, business premises or any other place are given to the officer of not below the rank of sub-inspector or officer of state food or Drug Administrator (Sec 12). Power of seize of products are given if they contravene the provision of this Act (Sec 13). Matter concerning to confiscation, punishment, adjudication, appeal are described in Sections 14, 15, 16,17).

Any person who produces or manufactures cigarettes or tobacco products contravene the provisions of this Act shall be in the case of first conviction be punishable with imprisonment up to two years, or with fine up to five thousand rupees, or with both, second and subsequent conviction is punishable with imprisonment up to 5 years and with fine up to Rs.10,000. (Sec 20). Any person who sells or distributes cigarettes or tobacco product contravene the provision of this Act shall be punished on first conviction with one year imprisonment or fine of Rs. 1000 or with both and for the second time or subsequent conviction the imprisonment may extend up to 2 years and with fine of Rs. 3000 (Sec 20 [2]). Company can also be punished (Sec 26).

Punishment for smoking in public places is a fine of Rs. 200 that is compoundable (Sec 21). Punishment for advertisement of cigarettes and tobacco products for the first time is 2 years imprisonment or with fine up to Rs. 1000 or with both and second or subsequent conviction imprisonment may go up to 5 years and fine of up to Rs.5000 (Sec 22).

Punishment for sale of cigarettes or any other tobacco products in certain places or to person below 18 years is up to Rs.200 and all offences are compoundable. Person who has committed offences under Sec 4 and Sec 6 can be detained till accused person furnishes his name or address satisfies the officer for further proceeding.

Central government can make rules to carry out the provision of this Act (Sec 31). Act is not applied to cigarettes or other tobacco product which are meant for export.

Comments

There is no evidence that self regulation by industry or public-private partnerships helps to prevent the harmful effects of tobacco, alcohol, and highly processed food and drink, a damning international analysis has found. it is also found that industry should have no role in the formation of policy on non-communicable diseases as there is no evidence to support such an approach. Instead, regulation or the threat of regulation, is the only way to achieve change (BMJ 2013).

THE NARCOTIC DRUGS AND PSYCHOTROPIC SUBSTANCES ACT, 1985

A significant number of young people in their prime of their lives fall prey to drugs and endanger their lives. They illegally procure them at a very high cost from bad elements of the society. Drug traffic is also associated with many crimes including sexual offences, theft, etc. that is why legal regulation is sought to curb the menace of drug abuse.

This Act deals with narcotic drugs, psychotropic substances and property derived from, or used in, illicit traffic in narcotic drugs and psychotropic substances, and to implement the provisions of the International Conventions on Narcotic Drugs and Psychotropic

Substances. It extends to the whole of India. Following terms are defined:

"*Addict*" is a person addicted to any narcotic drug or psychotropic substance (Sec 2) such as cannabis, coca, opium, poppy straw, concentrated, and includes all manufactured drugs.

Cannabis includes plant, charas, hashish oil or liquid hashish, ganja, any mixture of cannabis or drink prepared. Coca belongs to genus Errythroxylon includes leaf, crude cocaine, ecgonine, methyl ester of benzoyl-ecgonine and its salts, all preparations containing more than 0.1 per cent of cocaine.

Illicit traffic in relation to narcotic drugs and psychotropic substances means cultivation of coca or poppy or cannabis, engaging in the production, manufacture, possession, sale, purchase, transportation, warehousing, concealment, use or consumption, import inter-State, export inter-State, import into India, export from India or transshipment, of narcotic drugs or psychotropic substances; financing, abetting or conspiring, harboring persons engaged in any activities related to drugs, dealing and handling without authorization (Sec 2).

Opium (belong to a plant of the species Papaver somniferum L) includes coagulated juice of opium poppy, any product suitable for smoking, medicinal opium, phenanthrene alkaloids, namely, morphine, codeine, thebaine and their salts, diacetylmorphine, that is, the alkaloid also known as dia-morphine or heroin and its salts; and all preparations containing more than 0.2 per cent of morphine or containing any diacetylmorphine (Sec 2);

Poppy straw means all parts (except the seeds) of the opium poppy after harvesting whether in their original form or cut, crushed or powdered and whether or not juice has been extracted there from.

The Central Government shall take all such measures as it deems necessary or expedient for the purpose of preventing and combating abuse of narcotic drugs and psychotropic substances and the illicit traffic (Sec 4). The central government shall constitute an authority (Sec 4), the Narcotic Drugs and Psychotropic Substances Consultative Committee (Sec 6) and shall appoint a Narcotics Commissioner who exercise all powers and perform all functions relating to the superintendence of the cultivation and production of the opium (sec 5).

The Central Government may constitute the "National Fund for Control of Drug Abuse" that shall contained funds generated from the sale proceeds of any property forfeited, any grants received, and any income from investment of the amounts credited to the Fund and shall be used on interventions taken for combating illicit traffic (Sec 7). No person shall cultivate coca plant, opium poppy, cannabis plant or gather any portion of these plant or produce, manufacture, possess, sell, purchase, transport, warehouse, use, consume, import inter-State export inter-State import into India, export from India or transship any narcotic drug or psychotropic substance, except for medical or scientific purposes without permit or license or authorization from Central of State government (Sec 8). The central government shall give license for preparation of any flavoring agent (Sec 13) or for industrial purposes or for horticultural purposes (Sec 14).

Whoever, in contravention of any provision of this Act or any rule or order made or condition of a licence granted in relation to poppy straw, coca plant or leaves, or opium, cannabis other than ganja shall be punished with rigorous imprisonment for a term which shall not be less than ten years but which may extend to twenty years and shall also be liable to fine which shall not be less than one lac rupees but which may extend to two lac rupees (Sec 15, 16, 17, 18, 19, 21, 22, 24). In relation to cannabis plant, ganja, punishment with rigorous imprisonment for a term, which may extend to five years and shall also be liable to fine which may extend to fifty thousand rupees (Sec 20)

If the licence holder omits, without any reasonable cause, to maintain accounts or to submit any return or fails to produce license, or willfully and knowingly breach of any of the conditions of licence shall be punishable with imprisonment for a term which may extend to three years or with fine or with both (Sec 26).

Whoever possesses in a small quantity (Table) of narcotic drug or psychotropic substance for personal

consumption shall be punished with imprisonment for a term, which may extend to 6 months to one year or with fine or with both (Sec 27);

If a person convicted for any offence under sections 15-25 and subsequently commit similar offence may be punished with death penalty (Sec 31A).

Alcohol use is not included in this Act. Except few states that have ban and strict controls there is promotion of alcohol use in many other states. There are evidences that availability of such drug is associated with high uses and leading to addictions and subsequent high morbidity and mortality (Sahoo et al 2007).

THE DRUGS & COSMETICS ACT, 1940
(Amended in 1964, 1983, 2009)

This is an Act to regulate the import, manufacture, distribution and sale of drugs and cosmetics; It extends to the whole of India. In this Act, Ayurvedic, Siddha or Unani drug is defined as "drug includes all medicines intended for internal or external use for or in the diagnosis, treatment, mitigation or prevention of disease or disorder in human beings or animals, and manufactured exclusively in accordance with the formulae described in, the authoritative books of Ayurvedic, Siddha and Unani Tibb system of medicine, specified in the First Schedule" (Sec 3). This includes blood and blood product (amended). Cosmetic" means any article intended to be rubbed, poured, sprinkled or sprayed on, or introduced into, or otherwise applied to, the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance, and includes any article intended for use as a component of cosmetic. Drugs, devices including empty gelatine capsules are for internal or external use of human beings or animals and all substances intended to be used for or in the diagnosis, treatment, mitigation or prevention of any disease or disorder in human beings or animals, including preparations applied on human body for the purpose of repelling insects like mosquitoes or such substances (other than food) intend to affect the structure or any function of the human body or intended to be used for the destruction of vermin or insects which cause disease in human beings or animals, as may be specified from time to time by the Central Government by notification in the Official Gazette (Sec 3). Poisonous Substances are also defined (Sec 4)

Manufacture in relation to any drug or cosmetic includes any process or part of a process for making, altering, ornamenting, finishing, packing, labeling, breaking up or otherwise treating or adopting any drug or cosmetic with a view to its sale or distribution but does not include the compounding or dispensing of any drug, or the packing of any drug or cosmetic, in the ordinary course of retail business (sec 3).

The Central Government constitutes (Sec 5) the Drugs Technical Advisory Board to advise on technical matters arising out the administration of this Act (sec 5). The Board consists of the following members for three years, namely :- (i) the Director General of Health Services, ex officio, (Chairman); (ii) the Drugs Controller, India, ex officio; (iii) the Director of the Central Drugs Laboratory, Kolkata, ex officio; (iv) the Director of the Central Research Institute, Kasauli, ex office; (v) the Director of the Indian Veterinary Research Institute, Izatnagar, ex officio; (vi) the President of the Medical Council of India, ex officio; (vii) the President of the Pharmacy Council of India, ex officio; (viii) the Director of the Central Drug Research Institute, Lucknow, ex officio; (ix) two persons to be nominated by the Central Government from States; (x) one person elected by Pharmacy Council of India; (xi) one person elected from Medical Council of India; (xii) one person from the pharmaceutical industry; (xiii) one pharmacologist of the Indian Council of Medical Research; (xiv) one person of Central Council of the Indian Medical Association; (xv) one person of the Council of the Indian Pharmaceutical Association; (xvi) two persons Government Analysts nominated by the Central Government.

The Central Government establishes (Sec 6) a *Central Drugs Laboratory* under the control of a Director to carry out the functions. The Central Government constitutes (Sec 7) "the Drugs Consultative Committee" to advise the Central Government, the State Governments and the Drugs Technical Advisory Board on any matter tending to secure uniformity throughout India in the administration of this Act.

Nothing contained in sections 5 and 7 shall apply to Ayurvedic, Siddha or Unani drugs because separate section is given for these system (Sec 33).

Misbranded drugs are: - if it is so colored, coated, powdered or polished that damage is concealed or if it is made to appear of better or greater therapeutic value than it really is; or if it is not labeled in the prescribed manner; or if its label or container or anything accompanying the drug bears any statement, design or device which makes any false claim for the drug or which is false or misleading in any particular (sec 9).

Adulterated drugs & Cosmetics (Sec 9A & C) are: - if it consists, in whole or in part, of any filthy, putrid or decomposed substance; or if it has been prepared, packed or stored under unsanitary conditions whereby it may have been contaminated with fifth or whereby it may have been rendered injurious to health; or if its container is composed in whole or in part, of any poisonous or deleterious substance which may render the contents injurious to health; or if it bears or contains, for purposes of coloring only, a color other than one which is prescribed; or if it contains any harmful or toxic substance which may render it injurious to health; or if any substance has been mixed therewith so as to reduce its quality or strength.

Spurious drugs & Cosmetics (Sec 9B & D) are: - if it is imported under a name which belongs to another drug; or if it is an imitation of, or is a substitute for, another drug or resembles another drug in a manner likely to deceive or bears upon it or upon its label or container the name of another drug unless it is plainly and conspicuously marked so as to reveal its true character and its lack of identity with such other drug; or if the label or container bears the name of an individual or company purporting to be the manufacturer of the drug, which individual or company is fictitious or does not exist; or if it has been substituted wholly or in part by another drug or substance; or if it purports to be the product of a manufacturer of whom it is not truly a product.

No person shall import (Sec 10) or manufacture (Sec 16-18) any patent or proprietary medicine, which is not of a standard quality, or is misbranded, spurious, adulterated, or poor quality drugs and cosmetics. For import a license is required (Sec 10) from the Central/ state government. Every person holding a licence shall keep and maintain such records, registers and other documents (Sec 18B).

The Central Government can prohibit by notification the import of any drug or cosmetic involve any risk to human beings or animals or does not have the therapeutic value claimed for it or contains ingredients and in such quantity for which there is no therapeutic justification (Sec 10A). Government can make rules for manufacturing, labeling, coloring, methods of testing and analysis, import etc., of drugs and cosmetics (Sec 12).

Central and State Government shall appoint analyst (Sec 20), and inspector for implementation of the Act (Sec 21). Inspector has power to inspect any premises, take sample, search any person, stop and search any vehicle, vessel or other conveyance, seize the stock of drug or cosmetic and any substance or article, examine any record, register, and document (Sec 21). He may also purchase the drug or cosmetic to taking the sample (Sec 26). If any person willfully obstructs an Inspector shall be punishable with imprisonment, which may extend to three years, or with fine, or with both (Sec 22). Procedure of taking sample, stock, records etc., is defined in the Act (Sec 23). The cost of a test or analysis made by the Central Drugs Laboratory shall be paid by the complainant or accused as the Court shall direct (Sec 25).
The Government may, by notification in the Official Gazette, prohibit the manufacture, sale or distribution of such drug or cosmetic which is considered to be dangerous (Sec 26A). The Central Government may after consultation with, or on the recommendation of, the Board make rules for the purpose of Act (Sec 33).

Contravention of provision of Act shall be punishable with imprisonment for a term, which may extend to minimum of one year to life term and a fine which may extend to five thousand rupees or more and for subsequent offence person shall be punishable with more imprisonment for a term, or with fine or with both.

There are separate penalty for spurious, adulterated or substandard drug or cosmetics of manufacture, sale, etc.(Sec 27). Penalty for nondisclosure of the name of the manufacturer (Sec 28), penalty for not keeping

documents, etc., and for nondisclosure of information (Sec 28A), penalty for use of Government Analyst's report for advertising (Sec 29), and penalty for subsequent offences (Sec 30) are defined in the Act. The Central Government shall constitute the Ayurvedic, Siddha and Unani Drugs Technical Advisory Board and the Ayurvedic, Siddha and Unani Drugs Consultative Committee to advise the Central Government, the State Governments on any matter for the purpose of securing uniformity throughout India in the administration of this Act (Sec 33C & D). The central and state government shall appoint analyst (Sec 33F) and inspector (Sec 33G) who will conduct the duties of inspection, monitoring, and analysis of sampled ayurvedic, siddha or unani drugs. Penalties are specified in the Act for any contravention on first time (Sec 33 I) and on subsequent offences (33J).

Blood and blood products can be stored at the First Referral Units (FRUs) and district hospitals but its storage should follow all the guidelines prescribed by the government.

Comments

Time and again drug quality, vaccine and usable items are found defective. Recently defective measle vaccine and rusted AD syringes (BD) indicates poor implementation of the Act. 150 million AD syringes used for immunization program. 5 billion injection are given every year, 65% of which are unsafe. Glass syringes are not sterile in all cases in India. Plastic syringes are reused indiscriminately, one thrid had risk of transmitting blood borne diseases. 22% of unsafe injections are because of reuse, 20% are because of unsterile equipment, 54% because of wrong habits of health workers (TOI 18th May 2007).

THE DRUGS AND MAGIC REMEDIES (OBJECTIONABLE ADVERTISEMENTS) ACT, 1955

This Act is to control the advertisement of drugs and to prohibit the advertisement for certain purposes of remedies alleged to possess magic qualities. It extends to the whole of India except the State of Jammu and Kashmir (Sec 1) and applies also to persons domiciled in the territories to which this Act extends who are outside the said territories.

Magic remedy" includes a talisman mantra kavacha, and any other charm of any kind which is alleged to possess miraculous powers for or in the diagnosis, cure, mitigation treatment or prevention of any disease in human beings or animals or for affecting or influencing in any way the structure or any organic function of the body of human beings or animals (Sec 2).
No person shall take any part in the publication of any advertisement referring to any drug in terms, which suggest or are calculated to lead to the use of, that drug for (Sec 3)-

- The procurement of miscarriage in women or prevention of conception in women; or
- The maintenance or improvements of the capacity of human beings for sexual pleasure; or
- The correction of menstrual disorder in women; or
- The diagnosis, cure, mitigation, treatment or prevention of any disease, disorder or condition specified in the Schedule, or any other disease, disorder or condition (by whatsoever name called) which may be specified in the rules made under this Act;

No person shall advertise drugs that directly or indirectly gives a false impression regarding the true character of the drug; or makes a false claim for the drug (Sec 4) or for diseases, which require timely treatment by registered medical practitioners except person who is considered to be having special knowledge about disease and treatment in Ayurvedic or Unani system of medicines; No person carrying on or purporting to carry on the profession of administering magic remedies shall take any part in the publication of any advertisement referring to any magic remedy which directly or indirectly claims to be efficacious (Sec 5).

No person shall import or export any document containing and advertisement of treatment or drug.
Any Gazetted officer authorized by the State Government may enter and search at all reasonable times any place, seize any advertisement, any

document, article or thing which contains any such advertisement (Sec 8) that may furnish evidence of the commission of an offence punishable under this Act.

Whoever contravenes any of the provisions of this Act shall be punished on first conviction, with imprisonment, which may extend to six months, or with fine, or with both; In the case of a subsequent conviction, with imprisonment which may extend to one year, or with fine, or with both (sec 7).
The Center Government may, by notification in the Official Gazette, make rules for carrying out the purposes of this Act (Sec 16).

THE SCHEDULE [See Sections 3(d) and 14]

Name of the Diseases

1. Appendicitis
2. Arteriosclerosis
3. Blindness
4. Blood poisoning
5. Bright's disease
6. Cancer
7. Cataract
8. Deafness
9. Diabetes
10. Diseases and disorders of the brain
11. Diseases and disorders of the optical system
12. Diseases and disorders of the uterus
13. Disorders or menstrual flow
14. Disorders of the nervous system
15. Disorders of the prostatic gland
16. Dropsy
17. Epilepsy
18. Female diseases (in general)
19. Fevers (in general)
20. Fits
21. Forms and structure of the female bust
22. Gall stones, kidney stones and bladder stones
23. Gangrene
24. Glaucoma
25. Goitre
26. Heart diseases
27. High or low blood pressure
28. Hydrocele
29. Hysteria
30. Infantile paralysis
31. Insanity
32. Leprosy
33. Leucoderma
34. Lockjaw
35. Locomotor ataxia
36. Lupus
37. Nervous debility
38. Obesity
39. Paralysis
40. Plague
41. Pleurisy
42. Pneumonia
43. Rheumatism
44. Ruptures
45. Sexual impotence
46. Small pox
47. Stature of persons
48. Sterility in women
49. Trachoma
50. Tuberculosis
51. Tumors
52. Typhoid fever
54. Venereal diseases, including syphilis, gonorrhoea, soft chancre, venereal, granuloma and lympho granuloma

Reference

BMJ. Industry has no role in public health policies, concludes analysis *BMJ* 2013; 346 doi: http://dx.doi.org/10.1136/bmj.f943.

Gazette of India. The Cigarette and other tobacco products (Prohibition of Advertisement and regulation of trade and commerce, production, supply and distribution) Act, 2003 (34 of 2003). Govt. of India.

Gazette of India. The Narcotic Drugs and Psychotropic Substance Act, 1985 [Act No. 61 of 1985 dated 16th. September, 1985; Act No.2 of 1989]

Delhi Gazette. The Delhi Prohibition of smoking and nonsmokers Health Protection Act, 1996, Delhi Gazette, Extra., Pt IV, dated 1st Jan 1997.

Gazette of India. The Drugs and Cosmetics Act, 1940 [Act No. 23 of 1940].

Sahoo S, et al. Why is alcohol excluded and opium included in NDPS Act 1985? Ind J Psychiatry 2007; 49 (2): 126-128.

CHAPTER 69

LEGISLATION RELATED TO OTHER PUBLIC HEALTH PROBLEMS

THE TRANSPLANTATION OF HUMAN ORGANS ACT, 1994

The estimated number of new patients who reach end-organ failure in every year and died is as follows:

- Kidneys 100,000
- Liver 80,000
- Heart 80,000
- Lung Several thousand
- Pancreas > 50,000
- Cornea 10,00,000

Treatment available at present for these end organ problems is:

- Dialysis facilities available only at select centers.
- Kidney transplant to approximately 3500 per year. Most of the kidney transplantations are from live donors.
- Few thousand corneas are transplanted every year.
- Only few transplantations of liver (<150), heart (<40), lung (2), pancreas (2) done in the past 10 years.

Similarly there are paucity of skilled manpower and facilities in the country for transplantation. There are less than 100 kidney transplantation centers, less than 350 nephrologists involved in transplantation and less than 10 transplantation surgeons.

Although there is Transplant of Human Organ Act 1994 and rules 1995 applicable to whole of India, but services are not improving at the pace required for the quality health care delivery.

ACTIVITIES

1. Preventive

- For every patient who reaches end stage organ failure, there are ten who are in various stage of failure. Education, promotion of preventive measures, cross liasioning with various other programs such as Non-Communicable Disease control, etc. for following activities: healthy lifestyle habits and early detection management and follow-up.

2. Health Education

- Health education of the general public about healthy lifestyle for prevention of chronic diseases;
- Promoting awareness among professional of various disciplines as well as students at medical college level of the growing importance of prevention, timely recognition and treatment of various kinds of organ failure.
- Change in attitude of the general public about organ donation from the dead cadavers or brain stem dead patients for retrieval of organs. Existing religious beliefs prevent the near relatives from donating organs from dead patients. Results from cornea donations have also not been very encouraging.

3. Curative

- Encouragement for opening up of more centers for various kinds of transplantation.

- Dialysis: there should at least 2 machines at every district hospital with a nephrologist in the phased manner. There are approximately 600 districts, i.e., approximately 1200 dialysis machines are required. Indigenous machines are likely to cost approximately Rs. 1 to 1.5 lakh.
- Transplantation at every medical college and other suitable hospitals, in a phased manner.
- Coordination of pharmaceutical companies in making available the latest drugs required for organ failure and transplantation including immunosuppressants, in an expanding market, at lowered costs.

4. Surveillance and Research

- Collection of data regarding incidence, treatment, results, follow-up, efficacy of therapy.
- Analysis and publication of data.
- Pure research, especially in genetics/stem-cell/ nanotechnology/biomedical engineering, etc.

5. Training

- Number of transplant professionals is decreasing, while the number of patients is increasing.
- CME should be made available for practical and structured training at all levels.

6. Enhanced role of Organ Retrieval Banking Organization

There is a need of formation of Nodal center for transplantation activity that should be located at the state level. All altruistic donors intending to donate organs after deaths should be registered. Similarly potential recipients for cadavers transplants should also be registered. At the district level district organ transplant program should be run through district societies in collaboration with NGOs.

The Transplantation of Human Organ Act

With the advancement of science and technology it has become possible to remove organ from living as well as deceased persons and to transplant such organs to save the lives of suffering human beings. But, commercial dealings in human organs, especially kidney, has also increased. Thus a need for a comprehensive legislation for regulating the removal of organs from cadavers and living persons and prohibiting commercial dealings in human organs, was felt as the matter has been opposed by various sections of society. This Act repeals the Ear Drums and Ear Bones (Authority for use for therapeutic purposes) Act, and Eyes (Authority for use for therapeutic purposes) Act, 1982. Various terms are defined in detail, some of the important terms are as follows: 1) Brain-stem death-the stage at which all functions of the brain-stem have permanently and irreversibly ceased and is so certified by registered medical practitioners or board of experts, or any authority which have power to do so. 2) Deceased person- a person, in whom permanent disappearance of all evidence of life occurs, by reason of brain-stem death or in a cardiopulmonary sense, at any time after live birth has taken place. 3) Donor- any person, not less than eighteen years of age, who voluntarily authorizes the removal of any of his human organs for therapeutic purpose (Sec 2).

Other terms like human organs, near relatives, therapeutic purpose, transplantation, and payment are also defined. Any person more than 18 years or parents in case of less than 18 years authorizes hospital or institution the removal, before his death, of any human organ of his body. Any written authority given before his death or willingly given authority to any of his near relatives, can be accepted or he doesn't show unwillingness before death, then person possessing his dead body is authorized for removal of organs. Before removal of body organs, a board of medical expert should certify that life or brain-stem function have ceased.

A dead body lying in a hospital or prison and not claimed by any of the near relatives within 48 hours from the time of the death of concerned person, the person incharge or any other authorized persons who strongly believes that body will not be claimed, is authorized for removal of body organs. No hospital or place is legally authorized to remove the human organs unless appropriate authority like state or central government authorizes and register it (Secs. 10 -12 & 14-17).

Any illegal supply or giving commitment or publishing /advertisement to supply human organs or giving human organs on payment by an individual or society, or organization, or agent are considered as an offense and punishment may be awarded (Secs 18-22). Such person shall be punished for a term which shall not be less than 5 years but which may extend to ten years and shall be liable to fine which shall not be less than Rs. 5-20 lakh (Sec 19). Name of the doctors shall be

reported to MCI or state authority for taking necessary action including the removal of his name from the register for 2 years for the first conviction and permanently for the subsequent offence (Sec 18).

Under the section 24 the Central Government may make the rules. The Transplantation of Human Organs Rules 1995 were notified which were further modified in 2014 for smooth functioning and increasing the scope of organ and tissue transplantation.

National Organ and Tissue Transplant Organization (NOTTO) is a National level organization set up under Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India. It has following two divisions:
"National Human Organ and Tissue Removal and Storage Network"
"National Biomaterial Centre"

National Network division of NOTTO would function as apex centre for All India activities of coordination and networking for procurement and distribution of Organs and Tissues and registry of Organs and Tissues Donation and Transplantation in the country. At National Level :

- Lay down policy guidelines and protocols for various functions.
- Network with similar regional and state level organizations.
- All registry data from States and Regions would be compiled and published.
- Creating awareness, promotion of organ donation and transplantation activities.
- Co-ordination from procurement of organs and tissues to transplantation when organ is allocated outside the region.
- Dissemination of information to all concerned organizations, hospitals and individuals.
- Monitoring of transplantation activities in the Regions and States and maintaining data-bank in this regard.
- To assist in data management for organ transplant surveillance & organ transplant and Organ Donor registry.
- Consultancy support on the legal and non-legal aspects of donation and transplantation.
- Coordinate and Organize trainings for various cadre of workers.

National Biomaterial Centre (National Tissue Bank)
The centre will take care of the following Tissue allografts:

- Bone and bone products e.g. deep frozen bone allograft, freeze dried bone allograft, dowel allograft, AAA Bone, Duramater, facialata, fresh frozen human amniotic membrane, high temperature treated board cadaveric joints like knees, hips and shoulders, cadaveric cranium bone graft, loose bone fragment, different types of bovine allograft, used in orthodontics
- Skin graft
- Cornea
- Heart valves and vessels

COMMENTS

The name of the Act should changed to Transplantation of Human Organ and Tissue Act. "Near relative" should also include grand parents, grand children, uncle, and aunt who are blood related should go through authorization committee to decide whether the donor can give the organ or tissues.

The initial thinking was that a robust cadaver transplantation program by itself would stop trafficking in human organs. By this act, the brain death is now legally recognized as clinical death so that organs can harvested from brain-dead patients. The major spin – off is that treatment can be terminated once the brain death is certified, ventilators from a brain-dead victim can be disconnected and used for other needy patients. In public hospitals with lot of resource constraints, certification of brain death, independent of transplant potential, would rationalize usage of vital instruments like ventilators. Relatives of such patients should be motivated for organ donation at the Intensive Care Unit (ICU) and hospital level. Such hospitals should be able to remove the organ and tissues and store it for its use. Certain norms and standards need to be established for these hospitals and ICUs.

This Transplant Act is yet to become a reality at the national level. Very few hospitals in this country have a viable cadaver transplant program. Majority do no have facilities for maintaining a brain-dead victim on ventilator. And not many hospitals have qualified neurologists or neurosurgeons to certify the brain death. In such cases surgeon, anesthetist or intesivist

can be approved by the appropriate authority to take the decision of brain death. It is found that the state did not pursue the cadaver transplant program. Most transplant surgeons are interested in live unrelated donor program which is easier to organize and much more lucrative, than in cadaver transplant program.

Kidney trade is as rampant as it was before the promulgation of this Act because it does not ban kidney sales. This Act actually legalized the kidney trade by allowing total strangers to "donate" their kidneys "by reason of affection or attachment towards the recipient" which is a cardinal flaw built into the Act and leads to thousands of kidneys bought and sold all over the country (Amaloraparvanathan 2007). Organ sales went to such a ridiculous extent, that there were instances of prospective sellers of organs putting up notices outside hospitals offering their kidneys for a sum *(The Hindu, March 29, 2007 & HT June 2016).* Sellers are mostly young poor woman and buyers are mostly old and rich men and from foreign nationals. There is a need to remove the clause in the Act which permits unrelated live transplants. In all cases approval from authorization committee should require. Penalty for the offense should be severe so that offenders should not dare to do it. Even imprisonment of 5 years and fine of Rs. 5 lakh are less.

This is a miserable state of those who were compelled to sell their kidneys out of poverty (Goyal et al 2002). Organ sales in a third world country like India do not reduce the seller's poverty but it will cause a decline in health. What is worrying is that the "majority" of the experts feel that organ trade may be allowed in India.

The Committee set up by the Delhi High Court has, however, recommended that swap donations should be allowed. The Committee has recommended that two different willing but incompatible 'near relative' donors (vis-à-vis their intended related recipient) should be permitted to donate their organs in exchange without any commercial interest and only due to the reason that despite willingness, their organ was not found medically compatible for their intended recipients. This would greatly help patients who have 'near relatives' willing to donate but incompatible for their recipient. Swap operations may be considered by authorization committee on case-to-case basis and as per the existing Act and Rules.

Delhi High Court has recommended a post of a coordinator in the ICU (who may be a doctor or a senior nursing staff member) independent of the Transplant team, who is trained in the communications skills and who can liaison between the treating physician and the potential brain-death donor and ORBO. Such coordinators should possess skills to communicate with the relatives and friends of the patient with a view to explain to them the merits of cadaver donation and who possesses adequate knowledge to remove their doubts and answer their queries with regard to the procedures involved in transplantation activities. Donor transplant coordinators are generally responsible for the care of the person who has died, speaking to their family and organising the organ donation procedure. They support families before, during and after donation and are there to answer any questions they might have. Authorization to the hospital and ICUs should include this post.

To improve the effectiveness of Appropriate Authorities, it is proposed to vest in them the powers to summon any person, seek production of a document and issue a warrant for the search of any place suspected to be indulging in unauthorized transactions in human organs. A new section 16 A is proposed to be introduced accordingly.

Another problem with these rules are not very well explained as far as preservation of human organs is concerned. Similarly, who will do what in the hospital is also not explained.

Organ Procurement & Transplant Networks should be set up to propolarize the organ donation. Organ Retrieval & Banking Organisation (ORBO) set up at AIIMS in New Delhi is not able to perform the desired function of networking in the country.

National Organ & Tissue Transplantation organization has been set up under the Act 2011 but financial powers are not given to director of organization. Similarly limited powers are given to Regional and State organizations. This will limit the working of these organizations.

References

Maddav Goyal, et al. Economic and health consequences of selling a kidney in India. JAMA, 2002; 28, 13.

Amaloraparvanathan J. Kidneys for sale: organ transplantation workshop: A report. Economic and Political Weekly 2007; XLII (15): 1332-1333.

FOOD ADULTERATION

During last two decades the percentage of adulteration of food is found to be ranging from 8.1 to 14.2. Convictions of violator of law is less than 10% which indicates that there is a huge gap in implementation of the Prevention of Food Adulteration Act 1954. The practice of adulteration is more prevalent in Rajasthan, Madhya Pradesh, Himachal Pradesh, Orissa, Sikkim, Chandigarh. On the basis of analysis carried out in 2000 various food items are found adulterated which are given in table Table 69.1

Table 69.1: Percentage of food items found adulterated

	Food Items	Adulteration Percentage in 2000
1.	Alcohol and nonalcoholic Beverages	12.60
2.	Spices and Condiments	07.84
3.	Sweetening agents	11.70
4.	Tea, coffee, Coca	02.51
5.	Butter, Ghee, Ice Cream, & Milk Products	30.14
6.	Milk	19.36
7.	Fruit Products	02.91
8.	Edible Oils, Fats, Vanaspati	10.39
9.	Cereals, cereal products & Pulses	07.47
10.	Infant Food	08.50
11.	Other Foods	11.54
Average		**10.73**

EPIDEMIC DROPSY

Problem: Occurrence of Epidemic Dropsy is common in some parts of the country. An epidemic was witnessed in Delhi and neighboring states which took toll of hundred of lives in the months of August and September, 1998.

Cause: Contamination of mustard oil with argemone oil which contains a toxic alkaloid, sanguinarine. Sanguinarine interferes with the oxidation of pyruvic acid which accumulates in blood. Seeds of Argemone mexicana (Poppy Weeds) closely resemble mustard seeds which can be easily mixed with mustard seeds.

Symptomatology: Sudden onset of noninflammatory swelling of legs, glaucoma, nausea, vomiting, diarrhea, fever, dyspnoea, cardiac failure and death may occur in 5%-50% of cases. There is an occurrence of erythematous mottling and raised hemangiomas on the skin and mucous membranes. People of all ages and both sexes are affected equally on consumption of such contaminated oil.

Test for adulteration

1) Nitric acid test: In a sample of oil, nitric acid is added and then the tube is shaken up which give rise to orange-red color, indicates the presence of argemone oil. It does not give positive result if the level of oil is less than 0.25 percent.
2) Paper Chromatography test: It is highly sensitive test to detect argemone oil up to 0.0001 percent in all edible oil and fats.

Treatment: Supportive therapy for cardiac failure is effective, but the response may be slow. A high protein diet is beneficial. All contaminated mustard oil must be identified and further exposure avoided. Temporary ban can be imposed for the sale and use of oil. Mass awareness Program is required to control the epidemic. Selling of open oil should be discouraged and manufacturing at the local level without any specification and standard should be restricted.

FOOD SAFETY ANDSTANDARDS ACT 2006

(THE FOOD SAFETY AND STANDARDS ACT, 2006 NO. 34 OF 2006 [23rd August, 2006.])

Food Safety and Standard Act is to consolidate the laws relating to food and to establish the Food Safety and Standards Authority of India for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale

and import, to ensure availability of safe and wholesome food for human consumption and for matters connected therewith or incidental thereto. The Act extends to the whole of India. The Act defines following terms:

Adulterant means any material, which is or could be employed for making the food unsafe or sub-standard or mis-branded or containing extraneous matter.

Contaminant means any substance, whether or not added to food, but which is present in such food as a result of the production (including operations carried out in crop husbandry, animal husbandry or veterinary medicine), manufacture, processing, preparation, treatment, packing, packaging, transport or holding of such food or as a result of environmental contamination and does not include insect fragments, rodent hairs and other extraneous matter.

Food means any substance, whether processed, partially processed or unprocessed, which is intended for human consumption and includes primary food to the extent defined in clause (primary food), genetically modified or engineered food or food containing such ingredients, infant food, packaged drinking water, alcoholic drink, chewing gum, and any substance, including water used into the food during its manufacture, preparation or treatment but does not include any animal feed, live animals unless they are prepared or processed for placing on the market for human consumption, plants prior to harvesting, drugs and medicinal products, cosmetics, narcotic or psychotropic substances: Provided that the Central

Table 69.2 : Food Items with type of Adulteration or Contamination

Food Items	Adulteration/ Contamination	Method of determination
Non-Alcoholic Bev	Non-permitted colors, Saccharin, dulcin, lead, arsenic and copper, and Dirt and filth.	
Baking powder	Citric acid	
Starchy foods	Foreign starches in arrowroot, sand, dirt, etc.	
Spices	Sand, grit, coal tar dyes, saw dust,	add ether, put surface layer into another tube and add HCl, which will give pink color
Shah zeera	Excessive stalky & woody matter.	add water & HCl, which will give pink color
Haldi powder turmeric	Lead or lead chromate,	add water & HCl, which will give pink color
Coffee and Tea	Coal tar dyes, exhausted stuff, husk, tamarik husk, sand and grit, used tea dust,	
Milk, Paneer, Khoya	Water, Starch, Abstraction of fat, Urea	Heat Cool and drops of iodine give blue color
Ice Cream	Washing Powder, starch	Dissolve in water, heat, cool, add iodine it turn blue
Vanaspati	Animal fat, excessive hydrogenation Rancid stuff, foreign flavor	add equal quantity of HCl, furfural & shake gives crimson color.
Mustard seed	Argemone seeds can cause epidemic dropsy	
Oils	Mineral oil potential carcinogenic, argemone oil	Mixed petrol ether, add HCl, shake it will give pink
Dals (Pulses)	Coal tar dyes, Arhar, Moong, Washed channa, Metanil Yellow	add HCl will give pink color
Groundnut	Aflatoxin can cause cirrhosis of liver.	
Sugar	Chalk	dissolve in glass of water chalk will settle down
Honey	Water, Sugar	Burning will give chirping sound
Saffron	Colored dried tendril of maize cob	
Coffee	Chicory	Gently sprinkle coffee powder on water and chicory will settle down but not coffee

Government may declare, by notification in the Official Gazette, any other article as food for the purposes of this Act having regards to its use, nature, substance or quality.

Primary food means an article of food, being a produce of agriculture or horticulture or animal husbandry and dairying or aquaculture in its natural form, resulting from the growing, raising, cultivation, picking, harvesting, collection or catching in the hands of a person other than a farmer or fisherman.

Food additive means any substance not normally consumed as a food by itself or used as a typical ingredient of the food, whether or not it has nutritive value, the intentional addition of which to food for a technological (including organoleptic) purpose in the manufacture, processing, preparation, treatment, packing, packaging, transport or holding of such food results, or may be reasonably expected to result (directly or indirectly), in it or its by-products becoming a component of or otherwise affecting the characteristics of such food but does not include "contaminants" or substances added to food for maintaining or improving nutritional qualities.

Food business means any undertaking, whether for profit or not and whether public or private, carrying out any of the activities related to any stage of manufacture, processing, packaging, storage, transportation, distribution of food, import and includes food services, catering services, sale of food or food ingredients.

Food safety means assurance that food is acceptable for human consumption according to its intended use.

Food Safety Management System means the adoption of Good Manufacturing Practices, Good Hygienic Practices, Hazard Analysis and Critical Control Point and such other practices as may be specified by regulation, for the food business.

FOOD SAFETY AND STANDARDS AUTHORITY OF INDIA

The Central Government shall, by notification, establish a body to be known as the Food Safety and Standards Authority of India to exercise the powers conferred under this Act. The head office of the Food Authority shall be at Delhi and its offices at any other place in India. It will consists of Chairperson and twenty-two members out of which one-third shall be women, namely:- (a) seven Members, not below the rank of a Joint Secretary to the Government of India, to be appointed by the Central Government, to respectively represent the Ministries or Departments of the Central Government dealing with- (i) Agriculture, (ii) Commerce, (iii) Consumer Affairs, (iv) Food Processing, (v) Health, (vi) Legislative Affairs, (vii) Small Scale Industries, who shall be Members ex officio; (b) two representatives from food industry of which one shall be from small scale industries; (c) two representatives from consumer organizations; (d) three eminent food technologists or scientists; (e) five members to be appointed by rotation every three years, one each in seriatim from the Zones as specified in the First Schedule to represent the States and the Union territories; (f) two persons to represent farmers' organizations; (g) one person to represent retailers' organizations.

There shall be a Chief Executive Officer of the Food Authority as Member-Secretary of the Authority appointed by the Central Government. He/she shall be the legal representative of the Food Authority and shall be responsible for – all administrative and executive activities to achieve the aims and objectives of the Food Authority.

The Food Authority shall, establish a Central Advisory Committee consist of two members each to represent the interests of food industry, agriculture, consumers, relevant research bodies and food laboratories, and all Commissioners of Food Safety, and the Chairperson of the Scientific Committee shall be ex officio member.

The representatives of the concerned Ministries or Departments of the Central Government in Agriculture, Animal Husbandry and Dairying, Bio-technology, Commerce and Industry, Consumer Affairs, Environment and Forests, Food Processing Industries, Health, Panchayati Raj, Small Scale Industries and Food and Public Distribution or government institutes or organizations and government recognized farmers' organization shall be invitees to the deliberations of the Central Advisory Committee.

The Central Advisory Committee shall ensure close co-operation between the Food Authority and the enforcement agencies and organizations, advise the Authority for various issues and activities related to food safety and standards.

The Food Authority shall establish scientific panels, which shall consist of independent scientific experts to provide information and guidance to implementation of food safety and standards. It shall be responsible for providing the scientific opinions to the Food Authority, and shall have the powers, where necessary, of organizing public hearings. Food Authority shall regulate and monitor the manufacture, processing, distribution, sale and import of food so as to ensure safe and wholesome food.

GENERAL PRINCIPLES OF FOOD SAFETY

General principles to be followed in administration of the Act are:

(1) Endeavor to achieve an appropriate level of protection of human life and health and the protection of consumers' interests; carry out risk management; taking provisional risk management measures necessary to ensure appropriate level of health protection pending further scientific information taking technical and economic feasibility into account.

(2) The Food Authority shall, while framing regulations or specifying standards take into account- prevalent practices and conditions in the country including agricultural practices and handling, storage and transport conditions; and international standards and practices, where international standards or practices exist or are in the process of being formulated. It shall determine food standards on the basis of risk analysis; undertake risk assessment based on the available scientific evidence; ensure that there is open and transparent public consultation; ensure protection of the interests of consumers; ensure prevention of fraudulent, deceptive or unfair trade practices and unsafe or contaminated or sub-standard food. The provisions of this Act shall not apply to any farmer or fisherman or farming operations or crops or livestock or aquaculture, and supplies used or produced in farming or products of crops produced by a farmer at farm level or a fisherman in his operations.

ENFORCEMENT OF THE ACT

The Food Authority and the State Food Safety Authorities shall be responsible for the enforcement of this Act (Sec 29). The Food Safety Officers shall enforce and execute within their area the provisions of this Act with respect to which the duty is not imposed expressly or by necessary implication on some other authority. The Commissioner of Food Safety and Designated Officer shall exercise the same powers as are conferred on the Food Safety Officer and follow the same procedure specified in this Act. His functions will be:- (a) prohibit in the interest of public health, the manufacture, storage, distribution or sale of any article of food, which could be toxic, injurious, unsafe; (b) carry out survey of the industrial units; (c) conduct or organize training programs; (d) ensure an efficient and uniform implementation of the standards and other requirements as specified and also ensure a high standard of objectivity, accountability, practicability, transparency and credibility; (e) sanction prosecution for offences punishable with imprisonment under this Act.

The Commissioner of Food Safety may, by Order, delegate powers of conducting functions or give or suspend license to food business operators. He shall supervise and monitor the work of Designated Officer and food analysts.

ANALYSIS OF FOOD

The Food Authority may notify food laboratories and research institutions accredited by National Accreditation Board for Testing and Calibration Laboratories or any other accreditation agency for the purposes of carrying out analysis of samples by the Food Analysts under this Act. The Commissioner of Food Safety may appoint the persons to be Food Analysts for such local areas. Functions of Food Analyst shall be: receiving, analyzing and reporting of article of food.

OFFENCES AND PENALTIES

A person may render any article of food injurious to health by means of one or more of the following operations, namely: - (a) adding any article or substance to the food; (b) using any article or substance as an ingredient in the preparation of the food; (c) abstracting any constituents from the food;

or (d) subjecting the food to any other process or treatment, with the knowledge that it may be sold or offered for sale or distributed for human consumption.

The Food that is going to be used for human consumption should not have wrong labeling or information, probable cumulative toxic effects in ordinary quantities, quality or purity of the article, being primary food has fallen below the specified standard. While adjudging the quantum of penalty under this Chapter, the Adjudicating Officer or the Tribunal, as the case may be, shall have due regard to the following:- (a) the amount of gain or unfair advantage, wherever quantifiable, made as a result of the contravention, (b) the amount of loss caused or likely to cause to any person as a result of the contravention, (c) the repetitive nature of the contravention, (d) whether the contravention is without his knowledge, and (e) any other relevant factor.

Penalty for selling food not of the nature or substance or quality demanded. - Any person who sells to the purchaser's prejudice any food which is not in compliance with the provisions of this Act or the regulations made thereunder, or of the nature or substance or quality demanded by the purchaser, shall be liable to a penalty not exceeding five lakh rupees.

Penalty for sub-standard food shall be fine, which may extend to five lakh rupees. Penalty for misbranded food shall be fine, which may extend to three lakh rupees.

The Adjudicating Officer may issue a direction to the person found guilty of an offence under this section, for taking corrective action to rectify the mistake or such article of food shall be destroyed.

Penalty for misleading advertisement - (1) Any person who publishes, or is a party to the publication of an advertisement, which- (a) falsely describes any food; or (b) is likely to mislead as to the nature or substance or quality of any food or gives false guarantee, shall be liable to a penalty which may extend to ten lakh rupees.

Penalty for food containing extraneous matter shall be fine, which may extend to one lakh rupees. Penalty for failure to comply with the directions of Food Safety Officer - If a food business operator or importer without reasonable ground, fails to comply with the requirements of this Act or the rules or regulations or orders issued thereunder, as directed by the Food Safety Officer, he shall be liable to a penalty which may extend to two lakh rupees.
Penalty for unhygienic or unsanitary processing or manufacturing of food shall be fine, which may extend to one lakh rupees.

Penalty for possessing adulterant by any person who imports or manufactures for sale, or stores, sells or distribute any adulterant shall be liable- (i) where such adulterant is not injurious to health, to a penalty not exceeding two lakh rupees; (ii) where such adulterant is injurious to health, to a penalty not exceeding ten lakh rupees.

Penalty for contraventions for which no specific penalty is provided shall be fine, which may extend to two lakh rupees.

Punishment for unsafe food shall be - (i) where such failure or contravention does not result in injury, with imprisonment for a term which may extend to six months and also with fine which may extend to one lakh rupees; (ii) where such failure or contravention results in a non-grievous injury, with imprisonment for a term which may extend to one year and also with fine which may extend to three lakh rupees; (iii) where such failure or contravention results in a grievous injury, with imprisonment for a term which may extend to six years and also with fine which may extend to five lakh rupees; (iv) where such failure or contravention results in death, with imprisonment for a term which shall not be less than seven years but which may extend to imprisonment for life and also with fine which shall not be less than ten lakh rupees.

If a person without the permission of the Food Safety Officer, retains, removes or tampers with any food, vehicle, equipment, package or labeling or advertising material or other thing that has been seized under this Act, he shall be punishable with imprisonment for a term which may extend to six months and also with fine which may extend to two lakh rupees.

Punishment for false information shall be imprisonment for a term which may extend to three months and also with fine which may extend to two lakh rupees.

Punishment for obstructing or impersonating a Food Safety Officer - If a person without reasonable excuse, resists, obstructs, or attempts to obstruct, impersonate, threaten, intimidate or assault a Food Safety Officer in exercising his functions under this Act, he shall be punishable with imprisonment for a term which may extend to three months and also with fine which may extend to one lakh rupees.

Punishment for carrying out a business without license shall be imprisonment for a term which may extend to six months and also with a fine which may extend to five lakh rupees.

Punishment for subsequent offences - (1) If any person, after having been previously convicted of an offence punishable under this Act subsequently commits and is convicted of the same offence, he shall be liable to- (i) twice the punishment, which might have been imposed on a first conviction, subject to the punishment being maximum provided for the same offence; (ii) a further fine on daily basis which may extend up to one lakh rupees, where the offence is a continuing one; and (iii) his license shall be cancelled. (2) The Court may also cause the offender's name and place of residence, the offence and the penalty imposed to be published at the offender's expense in such newspapers or in such other manner as the court may direct and the expenses of such publication shall be deemed to be part of the cost attending the conviction and shall be recoverable in the same manner as a fine.

Compensation in case of injury or death of consumer - (1) Without prejudice to the other provisions of this Chapter, if any person manufactures or distributes or sells or imports any article of food causing injury to the consumer or his death, it shall be lawful for the Adjudicating Officer or the court to direct him to pay compensation to the victim or the legal representative of the victim, a sum- (a) not less than five lakh rupees in case of death; (b) not exceeding three lakh rupees in case of grievous injury; and (c) not exceeding one lakh rupees, in all other cases of injury: Provided that= the compensation shall be paid at the earliest to the next of the kin and in no case later than six months from the date of occurrence of the incident.

ADJUDICATION AND FOOD SAFETY APPELLATE TRIBUNAL

Any person aggrieved by any decision or order of the Adjudicating Officer, Tribunal may file an appeal to the High Court within sixty days from the date of communication of the decision or order of the Tribunal to him: Provided that the High Court may, if it is satisfied that the appellant was prevented by sufficient cause from filing the appeal within the said period, allow it to be filed within a further period not exceeding sixty days.

MISCELLANEOUS

The Central Government may, by notification in the Official Gazette, make rules for carrying out the provisions of this Act. Subject to the powers of the Central Government and the Food Authority to make rules and regulations respectively, the State Government may, after previous publication and with the previous approval of the Food Authority, by notification in the Official Gazette, make rules to carry out the functions and duties assigned to the State Government and the State Commissioner of Food Safety under this Act and the rules and regulations made thereunder.

THE PROTECTION OF HUMAN RIGHTS ACT, 1993

This is an Act to provides the constitution of a National Human Rights Commission, State Human Rights Commission in states and Human Rights Courts for better protection of Human Rights and for matters connected therewith or incidental thereto. It extends to the whole of India including Jammu & Kashmir in certain matters. The Act defines (Sec 2) 'human rights' as the rights relating to life, liberty, equality and dignity of the individual guaranteed by the Constitution or embodied in the International Covenants and enforceable by courts in India.

The Central Government shall constitute the National Human Rights Commission to exercise powers and to perform its functions (Sec 3). The Commission shall consist of a Chairperson who has been a Chief Justice of the Supreme Court who shall be appointed by

President of India and other members like judges and experienced persons. The Chairpersons of the National Commission for Minorities, the National Commission for the Scheduled Castes and Scheduled Tribes and the National Commission for Women shall be deemed to be Members and Secretary general.

The Commission shall perform the following functions:

a) inquire, suo motu or on a petition presented to it by a victim or any person on his behalf, into complaint of (i) violation of human rights or (ii) negligence in the prevention of such violation by public servant.
b) intervene in any proceeding involving any allegation of violation of human rights pending before a court with the approval of such court;
c) visit, any jail or any other institution under the control of the State Government, where persons are detained or lodged for purposes of treatment, reformation or protection to study the living conditions of the inmates;
d) review the safeguards provided by or under the Constitution for the protection of human rights and recommend measures for their effective implementation;
e) review the factors, including acts of terrorism that inhibit the enjoyment of human rights and recommend appropriate remedial measures;
f) study treaties and other international instruments on human rights and make recommendations for their effective implementation;
g) undertake and promote research in the field of human rights;
h) spread and promote human rights literacy among various sections of society;
i) encourage the efforts of non-governmental organizations and institutions working in the field of human rights;
j) any other functions as it may consider necessary for the protection of human rights.

The Commission shall (Sec 13) have power of summoning, enforcing the attendance and examining of witnesses on oath; discovery or production of or seize of any document; investigation or utilization of any other agency of investigation (Sec 14).

The Commission may call for information or report from the Central Government or any State Government or any other authority or organization (sec 17) or from armed forces. The Commission shall publish its inquiry report together with the comments of and action undertaken or going to be taken by the concerned Government or authority on the recommendations of the Commission (Sec 18). Powers are given in Sec 21 for the formation of state human rights commission.

Government may, with the concurrence of the Chief Justice of the High Court, specify for each district a Court of Session to be a Human Rights Court to try the said offences (Sec 30). For every Human Rights Court, the State Government shall, specify a Public Prosecutor or an advocate (Sec 31).

Reference

The Gazette of India. The Protection of Human Rights Act 1994. Govt. of India.

CHAPTER 70

LEGISLATION FOR WOMEN EMPOWERMENT & HEALTH

The Indian constitution prohibits discrimination on the ground of sex and guarantees equality. There are several laws specially for women and constitutional safeguards, which are available to women.

Legislations available for the safeguard of women are:
A. Marriage
1. The Hindu Marriage Act 1955
2. The Special Marriage Act 1954.
3. The Child Marriage Restraint Act 1979

B. Succession
1. The Hindu Succession Act 1959
2. The Indian Succession Act 1925.

C. Domestic Violence
1. The Dowry Prohibition Act 1961
2. The Commission of Sati (Prevention) Act 1987
3. Section 498 of Indian Penal Court: Cruelty to a woman within the matrimonial home.

D. Sexual Offences
1. Section 375; 376; 228-A; 511; and 509 of the Indian Penal Court: for Rape
2. Sections 114 A of the Indian Evidence Act 1872.
3. The indecent Representation of women (Prohibition Act 1986.

E. At Work
1. The Indian Constitution Article 14, 15, 16, and 39.
2. The ESI Act 1948
3. The Maternity Benefit Act 1961
4. The Factories Act 1948
5. The Equal Remuneration Act 1976
6. The Plantation Labor Act 1951
7. The Mines Act 1951
8. The Beedi and Cigar Workers Act 1966
9. The Contract Labor Act 1976

F. Prostitution
1. The Constitution of India: Article 23
2. Immoral Traffic (Prevention) Act 1956
3. Section 372 and 373 of Indian Penal Court
4. Section 360 and 371 of Indian Penal Court

G. Miscellaneous
1. The Medical Termination of Pregnancy Act 1971
2. The Prenatal Diagnostic Techniques (Regulation and Prevention of misuse) Act 1994
3. The Family Court Act 1986
4. The criminal Law 1983

Maternal Mortality

Maternal Mortality Rate is also very high. It is the risk of dying from causes associated with child birth. The numerator is the deaths arising during pregnancy or from puerperal causes, i.e., deaths occurring during and / or due to deliveries, complications of pregnancy, childbirth, and the puerperium. Women exposed to the risk of dying from puerperal causes are those who have been pregnant during the period. Their number

being unknown, the number of life births is used as the conventional denominator for computing comparable maternal mortality rates.

$$\text{MMR} : \frac{\text{No. of deaths from puerperal causes in a given area during a year}}{\text{No. of live births occurred among the population of the same area \& year}} \times 1000$$

WHO defines maternal mortality as death during pregnancy or within 42 days of delivery, in some defined areas, a period as long as a year is used.

Maternal Mortality Ratio is the annual number of deaths of women from pregnancy-related causes per 100000 live births. This is unfortunate that MMR in India is highest amongst the developing countries inspite of many programs, and policies.

Despite the existence of these constitutional and legal safeguards for women, they are routinely discriminated and exploited at home, at work, and in society at large. This is due to the lenient attitude of law protectors like police and judiciary.

Domestic violation

Prevention of violence against women requires involvement of both the state and civil society to create an environment where violence is acknowledged and recognized as a grave violation of human rights. It is not possible to change social attitudes and behavior instantly. It has to be a long term process.

There is a need to promote women's independence and economic self-reliance. Education and economic self-reliance can play a great role in asserting their leadership and decision making ability.

Men must be made to realize that gender-based violence is not a women's issue alone. Men must be made to understand that perpetrators of violence against women will be punished. This will adversely affect their families and communities.

It is easier to change knowledge, attitudes and behavior when one begins early. Hence, it crucial that we start sensitizing children and youth to the issue of violence against women. In school curriculum gender should be promoted with equality and mutual respect.

Community watchdogs such as sensitive NGOs working in the community can be encourage to report the cases to media and government and should promote to develop network against women violence. The media should be used effectively to communicate messages relating to gender violence. Police and judiciary need to be sensitized on this issues of gender violence leading to health effects and social consequences.

THE MEDICAL TERMINATION OF PREGNANCY (MTP) ACT, 1971 AND THE MTP RULES & REGULATIONS 2003

This law provides the liberalized conditions for women to seek abortion, and for doctors to do it. Following conditions are mentioned in the law when a pregnant woman can seek the facility of abortion:

1. ***Therapeutic***: when the continuation of pregnancy endangers the life of women or may cause grave injury to her physical or mental health.
2. ***Social***:
   a. When economic & social environment is not suitable for continuation of pregnancy
   b. Contraceptive failure
3. ***Humanitarian reasons*** (e.g. rape.),
4. ***Eugenic reasons*** when there is a risk that child born would be with serious physical or mental abnormalities as to be seriously handicapped (e.g. congenital defects, etc.),
5. When pregnant woman is ***mentally not sound*** (e.g. schizophrenia, mania etc.). Written consent of the guardian is necessary for abortion of such women.

Medical Termination of Pregnancy (MTP) can be done by a registered medical practitioner registered under the MCI Act only and those who have undergone 6 months housemanship or 3 years post graduate training in obstetrics and gynecology or any registered medical practitioner who have conducted 25 cases of MTP in approved institution, not by the practitioners of other system of medicine. When pregnancy is less than 12 weeks duration then one

State and Union Territories have been asked to set up Family Court in each district. The aggrieved person can approach the Family Court by way of a petition or representation. After the case is filed in the Family Court, a notice is sent to the respondent. Family Court provides a forum in which family disputes would be resolved in an atmosphere of reconciliation and understanding. In each Family Court there is a principal Counselor selected and appointed by the High Court and a panel of Counselors approved by the High court to assist the Principal Councilor and help the parties in arriving at reconciliation. Litigants are given an opportunity to open their minds before the counselor. Counselors help people to arrive at decisions by understanding their problems, giving them a chance to ventilate their grievances by supporting them emotionally and discussing various issues in the course of their discussion. Taking into consideration the social aspect of marital relationship, the Family Court provides the help of experts to find out solution for matrimonial problems. Assistance of social welfare agencies and medical personnel is sought in setting the matters. It is a specialized Court and the litigants are not required to be represented by Advocates in the Court as a right. Only with the Court's permission legal practitioners are allowed.

COMMENTS

An NGO's legal intervention is not always of help in prevention of domestic violence as observed in many cases. Recording and investigation of such an incidence is poorly handled at all levels.

A family is a social unit, defined primarily by reference to relationships which pertain to or arise from reproductive process and which are regulated by law or custom, especially the relationships which are established between a couple by marriage and those existing between a couple as parents and their children. This is usually a statistical unit for demography studies. ***Matriarchal Family:*** one in which the wife has supervisor authority in family matters. ***Patriarchal Family:*** One in which the husband has superior authority in family matters (Kishore 2007). The family as an institution is changing due to modernization, globalization, exposure to media, cultural revolution, etc. Such changes must be seen in Indian legislations so that there is less conflict among and between the contracting parties.

THE DOWRY PROHIBITION ACT, 1961

(Amended 1986) [Act No. 28 of Year 1961]

This is to prohibit the giving or taking of dowry. It extends to the whole of India except the State of Jammu and Kashmir. In this Act, "dowry" means any property or valuable security given or agreed to be given either directly or indirectly by one party to the other party to the marriage; or by the parents of either party to a marriage or by any other person; at or before or any time after the marriage but does not include *dower* or *mahr* in the case of persons to whom the Muslim Personal Law (Shariat) applies (sec 2).

If any person gives or takes or abets the giving or taking of dowry, he shall be punishable with imprisonment for a term, which shall not be less than five years, and with fine which shall not be less than fifteen thousand rupees or the amount of the value of such dowry, whichever is more. Nothing shall apply to presents, which are given at the time of marriage to the bride or bridegroom without any demand provided that such presents are entered in a list maintained in accordance with the rules made under this Act (Sec 3).

If any person demands, directly or indirectly, from the parents or other relatives or guardian of a bride or bridegroom, as the case may be, any dowry, he shall be punishable with imprisonment for a term which shall not be less than six months, but which may extend to two years and with fine which may extend to ten thousand rupees (Sec 4). There is a ban on advertisement showing any share in property, or any money or any business for the marriage (4A) and violation of this may be punished with imprisonment for a term which shall not be less than six months, but which may extend to five years, or with fine which may extend to fifteen thousand rupees. Any agreement for the giving or taking of dowry shall be void (Sec 5). Where any dowry is received by any person other than the woman in connection with whose marriage it is given, that person shall transfer it to the woman (Sec 6) or to her heirs in case of her death if occurred within 7 years of her marriage. Failing to transfer by such person may be punished with imprisonment for a term, which shall not be less than six months, but which may extend to two years or with fine or with both.

A complaint by the person aggrieved by the offence or a parent or other relative of such person, or by any recognized welfare institution or organization may file the case in court. Every offence under this Act shall be non-bailable and non-compoundable (Sec 8).

The Dowry Prohibition (Maintenance of lists of presents to the bride and bridegroom) Rules 1985 prescribes that list of gifts, and other items should be made and kept. Where the death of a woman is caused by any burns or bodily injury within 7 years of her marriage and shown that soon before death she was subjected to cruelty or harassment by her husband or any relatives is known as dowry death and punishment is for not less than 7 years but which may extend to life term imprisonment.

COMMENTS

The unnatural death of a married woman may be suicide, homicide or even accident. But such suicides and homicides are currently more commonly associated with the dowry disputes. When dowry expectations are not met, the young bride may be killed or compelled to commit suicide, either by burning, poisoning or by some other means. In one of the studies carried out on a cohort of 200 married female deaths, 35 (18%) were poisoning deaths and most of the women consumed organophosphorus compound and died within 10 days. The majority of the dowry affected wives were below 35 years of age. Most incidents occurred either during morning hour or during daytime.

The law is considered ineffective because it does not account for the parents of the girl who deprive her of education and opportunity, cloister her, and then marry her off at an early age. Wife murder in India is said to take place for economic reasons, i.e., to remarry and get more dowry. That Hindu men abandon or divorce wives, or commit bigamy belies that economics are the sole reason.

Section 304B is directed to marital murder, or death under unnatural circumstances, within 7 years of her marriage and dowry harassment by the husband or his relatives. The husband must prove he is not responsible for her death. The law is ineffective because complaints about unreasonable dowry demand are rarely made, and the assumption is that the death would occur within 7 years. Murder is also dealt with in the Section 302, punishment for murder; Section 306, abetment to suicide; and Section 498A (Agnes 1993).

THE COMMISSION OF SATI (PREVENTION) ACT, 1987

[Act No. 3 of 1988]

The Commission of Sati Act is to provide for the more effective prevention of the commission and glorification of Sati and for matters connected therewith or incidental thereto. Sati or the burning or burying alive of widows or women is revolting to the feelings of human nature and is nowhere enjoined by any of the religions of India as an imperative duty; it is necessary to take more effective measures to prevent the commission of sati and its glorification. It extends to the whole of India except the State of Jammu and Kashmir.

Whoever attempts to commit sati and does any act towards such commission shall be punishable with imprisonment for a term which may extend to six months or with fine or with both, provided that the Special Court trying an offence under this section shall, before convicting any person, take into consideration the circumstances leading to the commission of the offence, the act committed, the state or mind of the person charged of the offence at the time of the commission of the act (Sec 3).

If any person commits sati, whoever abets the commission of such sati, either directly or indirectly in whatever manner, shall be punishable with death or imprisonment for life and shall also be liable to fine (Sec 4).

Whoever does any act for the glorification of sati shall be punishable with imprisonment for a term which shall not be less than one year but which may extend to seven years and with fine which shall not be less than five thousand rupees but which may extend to thirty thousand rupees.

The Collector or the District Magistrate may, by order, prohibit the doing of any act towards the commission of sati by any person or glorification in any area or areas specified in the order. Whoever contravenes

such order shall be punishable with imprisonment for a term which shall not be less than one year but which may extend to seven years and with fine which shall not be less than five thousand rupees but which may extend to thirty thousand rupees (Sec 6).

The State Government may remove any temple or other structure which has been in existence for not less than twenty years, any form of worship or the performance of any ceremony is carried on with a view to perpetuate the honor of, or to preserve the memory of, any person who committed sati (Sec 7) and may also seize properties (Sec 8). All offences under this Act shall be triable only by a Special Court (Sec 9) and a special public prosecutor (Sec 10).

THE IMMORAL TRAFFIC (PREVENTION) ACT, 1956

The Indian Penal Code – The Indian Penal Code lays down a number of provisions, which are related to trafficking. Some of these include:
Kidnapping, abducting or inducing woman to compel her for marriage, etc (Section 366).
Selling minors for purposes of prostitution, etc (Sec 372).
Buying minors for purposes of prostitution, etc (Sec 373).
Wrongful restraint (Section 339).
Wrongful confinement (Section 340).

An Act to provide in pursuance of the International Convention signed at New York on the 9th day of May 1950 for prevention of immoral traffic. Prostitution is a social evil and indicating towards poverty and disparity in distribution of resources. No women would like to indulge in prostitution until circumstances forces her to do so. It is indirect indicator of problem of drug, lower status of women, alcoholism, weak social fabric leading to female feticide (Kishore 2005). Recently emergence of HIV and AIDS has once again forced the society to reconsider the need to change the concept of sexuality. High prevalence of sexual transmission of diseases among commercial sex workers and deaths due to HIV and AIDS in them need legal action beside health action from the government.

In section 2, many words like brothel is defined as "any house, room, or place used for purpose of sexual exploitation or abuse for the gain of another person or for the mutual gain of two or more prostitutes", child is the one who has not completed 16 years of age, "minor" who has completed 16 years but not completed 18 years and "major" who has completed 18 years of age, and prostitution has been defined as "sexual exploitation or abuse of person for commercial purposes".

Any person who keeps or manages, or acts or assists in the keeping or management of, a brothel, shall be punishable on first conviction with rigorous imprisonment for a term of not less than one year and not more than three years and also with fine which may extend to Rs. 2000/- and in the event of a second or subsequent conviction, with rigorous imprisonment for a term of not less than two year and not more than 5 years and also with fine which many extend to Rs. 2000/- (Sec 3).

Programs and Schemes for prevention of Immoral Traffic of women and children

'Ujjawala' – The MWCD till November, 2007 had decided to implement three pilot projects, to combat trafficking of women and children for commercial sexual exploitation under the sanction of tradition in source areas and in destination areas. It was decided to convert these three projects into a comprehensive scheme in the Eleventh Five Year Plan (2007-12) of the Government. Thus, 'Ujjawala', a new "Comprehensive Scheme for Prevention of Trafficking and Rescue, Rehabilitation and Re-Integration of Victims of Trafficking and Commercial Sexual Exploitation" was launched in 2007.

Swadhar' and Short Stay Homes – The MWCD runs shelter based homes, such as short stay homes and 'Swadhar' homes for women in difû cult circumstances. These schemes also cater to trafû cked women/girls rescued or runaway from brothels or other places. The schemes provide for shelter, food, clothing, counselling, clinical, medical, and legal and other support, training and economic rehabilitation and helpline facilities. Many of these homes are equipped with women helplines for emergency response. At present, there are 380 short stay homes and 240 'Swadhar' homes functioning in the country. State Governments also separately run shelter homes for women and children in distress. Many of these homes are equipped with women helplines for emergency response.

Child Line Services – Child Line, the toll-free number 1098, is a 24-hour telephone service run under the aegis of MWCD, available to all children in distress or to adults on behalf of children in distress.

'Dhanalakshmi', conditional cash transfer scheme for girl child with insurance cover was launched by the MWCD in January 2008 as a pilot project in select districts of select States. The scheme provides for cash transfers to the mother of the girl child on performance of certain conditionality such as birth of the girl child and registration of her birth, immunization, enrolment, retention in school and her remaining unmarried till the legal age of marriage, 18 years. It is expected that the scheme would ensure that the girl child is not only born but also that she is enrolled and retained in school which would decrease her vulnerability to trafficking, child labour, child marriage etc.

Kishori Shakti Yojana (Adolescent Empowerment Scheme) which is being implemented by MWCD, the targets adolescent girls in the age group of 11 to 18 years, to address their needs of self development, nutrition and health status, literacy and numerical skills, vocational skills etc.

Nutrition Programme for Adolescent Girls addresses the problem of under-nutrition among adolescent girls, pregnant women and lactating mothers. Nutrition Programme for Adolescent Girls (NPAG) was launched in the year 2002-03. Under this scheme, which was implemented by the MWCD, foodgrains were given to under nourished adolescent girls, pregnant women and lactating mothers. A proposal to integrate Kishori Shakti Yojana and the NPAG, and expand its coverage nationally is under preparation . The new scheme called the Rajiv Gandhi Scheme for Adolescent Girls will provide inputs for holistic empowerment of these girls.

Working Women's hostels to provide safe and affordable housing for women working away from their homes. The Government runs working women's hostels with facilities of crèches for their children so that these children are in a protective environment.

Working Women's hostels to provide safe and affordable housing for women working away from their homes. The Government runs working women's hostels with facilities of crèches for their children so that these children are in a protective environment.

VIOLENCE AGAINST WOMAN
(Gender Violence and Domenstic violence)

Violence against women by their live-in spouses or partners is a widespread phenomenon, both in the developed and developing world, as well as rural and urban areas. Prevalence of violence is found lowest (15%) in Urban Japan and highest (71%) in Rural Ethiopia (WHO Lancet 2006). Violence can occur during any phase of a woman's life. Many women experience multiple episodes of violence throughout their lives. Table 70.1 shows overview as it occurs through the lifecycle (WHO 1996).

Table 70.1: Gender violence through the lifecycle

Phase	Type of violence
Prebirth	Female feticide; battering during pregnancy (emotional and physical effects on the women, effects on birth outcomes; Coerced pregnancy (rape).
Infancy	Female infanticide; malnutrition
Below 5 year girls	Differential access to food and medical care; neglect of education; sexual abuse; physical abuse; and emotional violence-through sense of rejection.
Adolescent & adult women	Early marriage; early pregnancy; forced marriage; sexual violence; domestic violence; dowry harassment; infertility /failure to produce son related violence; witch hunting; honor killing; desertation; sexual harassment at workplace; acid burns; denial of entitlements; mental torture, living with fear, suspicion, false accusations of infidelity; etc.
Elderly	Desertation; neglect; medical neglect; women & widow

The domestic violence is the most prevalent yet relatively hidden form of violence against women and girls. In India, domestic violence is deeply embedded in patriarchal norms and attitudes about gender relations. These attitudes are reinforced by the lack

Factors That Perpetuate Domestic Violence

Cultural

- Gender-specific socialization
- Cultural definitions of appropriate sex roles
- Expectations of roles within relationships
- Belief in the inherent superiority of males
- Values that give men proprietary rights over women and girls
- Notion of the family as the private sphere and under male control
- Customs of marriage (bride price/dowry)
- Acceptability of violence as a means to resolve conflict

Economic

- Women's economic dependence on men
- Limited access to cash and credit
- Discriminatory laws regarding inheritance, property rights, use of communal lands, and maintenance after divorce or widowhood
- Limited access to employment in formal and informal sectors
- Limited access to education and training for women

Legal

- Lesser legal status of women either by written law and/or by practice
- Laws regarding divorce, child custody, maintenance and inheritance
- Legal definitions of rape and domestic abuse
- Low levels of legal literacy among women
- Insensitive treatment of women and girls by police and judiciary

Political

- Under-representation of women in power, politics, the media and in the legal and medical professions
- Domestic violence not taken seriously
- Notions of family being private and beyond control of the state
- Risk of challenge to status quo/religious laws
- Limited organization of women as a political force
- Limited participation of women in organized political system

Source: Unicef 2000

of government attention, either directly through the protection of victims of domestic violence and prosecution of violent husbands, or indirectly, by upholding laws on minimum age at marriage and inheritance. This combination of factors serve to both legitimize and perpetuate violence. Violence in the domestic sphere relates to dowry harassment, physical violence or battering, death threats, mental torture, cruelty, and increasing desertion of women (Gopal 1999). It is mostly perpetrated by males who are, or have been in, position of trust, intimacy and power-husbands, fathers, father-in-law, stepfathers, brothers, uncles, sons, and other relatives.

Health consequence of violence against women are:

A. *Non-Fatal consequences*

a. Physical health consequence

Injury; unwanted pregnancy; gynecological problems; STDs including HIV; Miscarriage; Pelvic inflammatory diseases; Chronic pelvic pain; Headache; Asthma; irritable bowl syndrome; self-injurious behavior, e.g. smoking, unprotected sex.

b. Mental health consequence

Depression; fear; anxiety; low self-esteem; sexual dysfunction; eating problems; obsessive-compulsive disorders; post-traumatic stress disorders; post partum depression; etc.

B. *Fatal consequence*

Suicides; Homicides; Maternal deaths; HIV/AIDs, etc.

In recent survey (NFHS-3) it is found that 37.2% of the ever married women experienced spouse violence. It is more common in rural areas (40.2%) than urban areas (30.4%). It is interesting to note that as education of women increased the rate of violence decreased. 46.7% of illiterate women has experienced violence where as it is 16.2% only in women who were educated more than 10 standard of education. This survey findings are opposite of observations made in other part of the world where increase in education is associated with higher number of violence acts (Moracco et al 2007).

THE PROTECTION OF WOMEN FROM DOMESTIC VIOLENCE ACT 2005

Domestic violence is one of the gravest and the most pervasive human rights violation. This legislation is a comprehensive law and addresses all issues related to women. It is for the first time that an act has been made to address women's issues in such detail. The Act is an extremely progressive one not only because it recognizes women who are in a live in relationship but also extends protection to other women in the household, including sisters and mothers thus the Act includes relations of consanguinity, marriage, or through relationships in the nature of marriage, adoption, or joint family thus, 'domestic relationships' are not

restricted to the marital context alone. In fact the Act has given a new dimension to the word abuse because unlike the primitive notion abuse includes actual abuse or threat of abuse, whether physical, sexual, verbal, economic and harassment by way of dowry demands and thus, under the new law.

Domestic violence includes not only physical violence by the husband, such as beating or physically hurting his wife, or sexual violence like forced intercourse, but also verbal or emotional violence such as insulting the wife or preventing her from taking up a job, and even economic violence such as not allowing the wife to use her salary. The Act defines Domestic violence as "the person -a) habitually assault or makes the life of the aggrieved person miserable by cruelty of conduct even if such conduct does not amount to physicall ill-treatment; or b) forces the aggrieved person to lead an immoral life; or otherwise injuries or harms the aggrieved person."

Harassment by way of unlawful dowry demands on the woman or her relatives also comes under this definition. The law will cover those women who are or have been in a relationship where both parties have lived together in a shared household, and are related by marriage or adoption. One of the most important features of the Act is that it also provides a woman a right to reside in the matrimonial and shared household, whether or not she has any title in the household. Husbands or live-in partners who would be guilty of domestic violence can be put behind bars for a year and fined Rs 20,000. And all crimes in the Domestic Violence Act are non-bailable.

Physical violence is defined as any act or conduct which is of such a nature as to cause bodily pain, harm, or danger to life, limb, or health, or an act that impairs the health or development of the person aggrieved, or that includes assault, criminal intimidation and criminal force. In addition to physical violence of beating, slapping, hitting, kicking and pushing, the Act also covers *sexual violence* like forced intercourse, forcing his wife or mate to look at pornography or any other obscene pictures or material and child sexual abuse. The new law also addresses sexual abuse of children and forcing girls to marry against their wishes.

The new law is also tough on men who subject women to name calling or verbal abuse. While Verbal Violence is often trivialized as unimportant, observers say it can damage a woman's self-esteem. The Act defines *verbal violence as*: name calling, any kind of accusation on a woman's character or conduct, insults for not bringing dowry, preventing a woman from marrying a person of her choice, any form of threat or insults for not producing a male child. Another significant step has been to recognize economic violence. Under the Act *economic violence* is: not providing money, food, clothes, medicines; causing hindrance to employment opportunities; forcing a woman to vacate her house; and not paying rent.

As is apparent the inclusion of economic violence is a very forward-thinking and important part of this definition. The deprivation of economic or financial resources to which the aggrieved woman or child is entitled under law or custom, or which the person aggrieved requires out of necessity, can be claimed under the provisions of this law; withholding such resources now falls under the category of economic abuse. This provision comes into play in instances of marital disputes, where the husband tends to deprive the wife of necessary money as a weapon. The law also sees a husband who sells off his wife's jewelry and assets as being guilty of economic abuse.

Under the Act the law provides for the setting up and function of Protection Officers. The State Government will appoint protection officers to help the affected women. These protection officers are likely to be appointed in every district across the country, helping the victims file cases before the magistrates. According to the provisions of the Act, the woman will be given complete protection. Her 'tormentor' would be ordered not to attempt to communicate with her, including at her workplace. The court can pass 'protection orders' so that the charged person will not cause violence to the woman's relatives. Apart from this, the woman can rightfully continue to live under the same roof with the man while fighting him in the court. According to the Act, the woman will have the right to a 'secure housing ' in the matrimonial or shared household. The PO will assist the court in making a Domestic Incident Report or an application for a protection order on behalf of the aggrieved woman and/or child. POs will ensure that aggrieved people are provided legal aid, medical services, safe shelter and other required assistance. POs will ensure that necessary information on service providers is provided to the aggrieved woman, and that orders for monetary relief are complied with. Importantly, the PO can be penalized

for failing/refusing to discharge his duty, with the proviso that prior sanction of the state government is required. The other relief envisaged is that of the power of the court to pass protection orders that prevent the abuser from aiding or committing an act of domestic violence or any other specified act, entering a workplace or any other place frequented by the abused, attempting to communicate with the abused, isolating any assets used by both the parties. It also provides for a breach of protection order or an interim protection order by a respondent as a cognizable and non-bailable offence punishable with imprisonment for a term, which may extend to a year or with a fine, which may extend to twenty thousand rupees or with both. Similarly, noncompliance or discharge of duties by the Protection Officer is also sought to be made an offence under the Act with similar punishment.

An important addition to the law ensures that an aggrieved wife, who takes recourse to the law, cannot be harassed for doing so. Thus, if a husband is accused of any of the above forms of violence, he cannot during the pending disposal of the case prohibit/restrict the wife's continued access to resources/ facilities to which she is entitled by virtue of the domestic relationship, including access to the shared household. In short, a husband cannot take away her jewelry or money, or throw her out of the house while they are having a dispute.

A woman who is the victim of domestic violence will have the right to the services of the police, shelter homes and medical establishments. She also has the right to simultaneously file her own complaint under Section 498A of the Indian Penal Code.

Sections 18-23 of the Act provide a large number of avenues for an abused woman to get relief. She can get, through the courts, Protection Orders, Residence Orders, Monetary Relief, Custody Order for her children, Compensation Order and Interim/ Ex parte Orders.

There are concerns about this the Act that it can be misused to blackmail men. There would be certain cases where the complaint is legitimate, but also cases where the complaint could be fabricated or concocted and that the Act will be misused by immoral wives to get rid of husbands and indulge in infidelity rather than those who are really tormented by husbands. To prevent this, the investigating machinery must ensure that the complaints are genuine, not faked.

So far, sections 498(A) (husband or relative of husband of a woman subjecting her to cruelty), 304/B (dowry death), 306 (abetment to suicide) of the Indian Penal Code was the only weapon which women had for fighting cruelty against her. Apparently the section was more misused than used the act is an extension of these sections and there are all possibilities of it being misused. But why not look at it with a different perspective that these sections are not against men but are in favor of women.

Indecent Representation of Women (Prohibition) Act 1986

This act prohibits improper representation of women in print advertisement and publication. Violation of any of the provision of this act shall be punishable with imprisonment of up to 2 years.

References

Agnes F. Marital murders — the Indian reality. Health Millions. 1993 Feb;1(1):18-21.

Gazette of India. The Dowry Prohibition Act, 1961. Gazette of India, Act No. 28 of 1961 and amended on 1986.

Gazette of India. The Medical Termination of Pregnancy (Amendment) Act 2002 (64 of 2002) w.e.f. 18.6.2003 vide SO. 704 (E) dt 18.6.2003.

Gazette of India. The Medical Termination of Pregnancy Rules 2003. Gazette of India, Extra., Pt II, Sec 3 (ii), dated 18th June vide SO 704 (E) 2003.

Gazette of India. The Immoral Traffic (Prevention) Act 1956 [Act No. 104 of 1956] as amended up to Act No. 44 of 1986.

Geethadevi M, Raghunandan R, Shobha. Getting away with murder. How law courts and police fail victims of domestic violence. Manushi. 2000 Mar-Apr;(117):31-41.

Gopal S, Shiva M. National Profile on women, health and development: India (ed). New Delhi: Voluntary Health Association of India 1999.

Kumar V. Poisoning deaths in married women. J Clin Forensic Med. 2004 Feb;11(1):2-5.

Kishore J. The Vanishing Girl Child. New Delhi: Century Publications 2005.

Kishore J. A Dictionary of Public Health. New Delhi: Century Publications 2007.

Karbak S. Gender Violence. Independent Commission on development and Health in India. New Delhi: Voluntary Health Association of India 2004.

Moracco KE, et al. Women's experience with violence: A National Study. Women's Health Issues 2007; 17: 3-12.

Unicef. Domestic violence against women and child. Italy: Unicef 2000; Innocento Digest No.6.

WHO.'Violence against Women: WHO Consultation', Geneva: WHO 1996: p26- 27.

CHAPTER 71

LEGISLATION FOR CHILD PROTECTION & HEALTH

With one- fifth of the world's children, India is home to the second largest child population in the world. Accounting for the largest number of children in work; sexually abused children and the second largest number of children affected by HIV, India can arguably be seen as having the highest number of children facing exploitation and neglect. India is home to the largest child labour force, 13 million children according to official Indian statistics, and 35 million according to UNICEF, accounting for about 14% of children in the 5 - 14 years age group. There has been a 40% increase in intra state migration in the last 10 years (India Statistics report, 2004). Children of migrant workers are often uncounted and as a result have little or no access to basic services, falling through any existing safety nets and at high risk of exploitation and abuse. The dicriminination against girl child has led deteriotaing sex ratio in the country and below national averages in the most of the proposed states.

Although a plethora of legislations and policies exist for the protection of children, these have made little difference to date. Loopholes in the laws coupled with a lack of effective implementation of policies; cultural tolerance of certain practices, and a general public apathy of the serious levels of harm faced by millions of children have led to the situation remaining relatively unchanged despite strides made in recent years in economic development and certain social indicators such as primary school enrolment rates.

The Integrated Child Protection Scheme is a landmark initiative of government of India with the support of UNICEF given in its holistic nature and its exclusive concentration on a previously neglected area of child development. Standing on the threshold of the 11th Five Year Plan, this Scheme also promises to provide a powerful platform to promote government partnerships with civil society actors and international organizations.

The MWCD has developed an ambitious Scheme the 'Integrated Child Protection Scheme' (ICPS) which aims to create a protective environment for children through strengthening of institutional structures, capacity building of caretakers, drafting of appropriate legislations and convergence of existing child protection Programmes such as the Juvenile Justice Act and the Child Labour Act (Unicef 2006).

Objectives of ICPS

The objectives of the scheme is to improve the well being of children in difficult circumstances, as well as to reduce the vulnerabilities that lead to abuse, neglect, exploitation, abandonment and separation of children from parents. This will be achieved by:

- Improved access to and enhancement in quality of child protection services.
- Enhancement of capacities at all levels on child protection.
- Raising public awareness on child rights situation and protection in India.
- Creating a knowledge and information database for child protection services.
- Clearly articulating responsibilities and enforced accountability for child protection.
- Establish functional structures at all government

levels for delivery of services to children in difficult circumstances.
- Evidence based monitoring and evaluation.

There are many legislations to protect the children in India and need to be understood by the public health professionals and workers.

THE PRE-CONCEPTION AND PRE-NATAL DIAGNOSTIC TECHNIQUES (PROHIBITION OF SEX SELECTION) ACT, 1994

This Act was enacted for the prohibition of sex selection, before or after conception, and for regulation of per-natal diagnostic techniques for the purposes of detecting genetic abnormalities or metabolic disorders or chromosomal abnormalities or certain congenital malformations or sex-linked disorders and for the prevention of their misuse for sex determination leading to female feticide. This Act was brought into operation from 1st January 1996. During the course of implementation of this Act, due to certain practical difficulties faced by the administration and emergence of new techniques for conception the Act and Rules were amended which came into existence from 14.2.2003. This Act extends to the whole of India except Jammu Kashmir. The Act defines (Sec 1) various terms –

"Conceptus" means any product of conception at any stage of development from fertilization until birth including extra embryonic membranes as well as the embryo or fetus;

"Embryo" means a developing human organism after fertilization till the end of eight weeks (56 days);

"Fetus" means a human organism during the period of its development beginning on the 57 days following fertilization or creation (excluding any time in which its development has been suspended) and ending at the birth;

"Genetic Counseling Center" means an institute, hospital, nursing home or any place, by whatever name called, which provides for genetic counseling to patients;

"Genetic Clinic" means a clinic, institute, hospital, nursing home or any place, [or any vehicle, where ultrasound machine or imaging machine or scanner or other equipment capable of determining sex of the fetus or a portable equipment which has the potential for detection of sex during pregnancy or selection before conception, is used], by whatever name called, which is used for conducting prenatal diagnostic procedures;

"Genetic Laboratory" means a laboratory and includes a place where facilities are provided for conducting analysis or tests of samples received from Genetic Clinic for prenatal diagnostic test;

"Gynecologist" means a person who possesses a postgraduate qualification in gynecology and obstetrics;

"Medical Geneticist" includes a person who possesses a degree or diploma in genetic science in the field of sex-selection and prenatal diagnostic techniques or has experience of not less than two years in any of these fields after obtaining- medical qualification or a postgraduate in biological sciences;

"Prenatal diagnostic procedures" means all gynecological or obstetrical or medical procedures such as ultrasonography, fetoscopy, taking or removing samples of amniotic fluid, chorionic villi, embryo, blood or any other tissue or fluid of a man, or of a woman before or after conception, for being sent to a Genetic laboratory or genetic clinics for conducting any type of analysis or prenatal diagnostic test for selection of sex before or after conception;

"Prenatal diagnostic test" means ultrasonography or any test or analysis of amniotic fluid, chorionic villi, blood or any tissue or fluid of a pregnant woman or chromosomal abnormalities or congenital anomalies or hemoglobinopathies or sex-linked diseases;

"Sex selection" includes any procedure, technique, test or administration or prescription or provision of anything for the purpose of ensuring or increasing the probability that an embryo will be of a particular sex;

No such genetic or prenatal diagnostic center or laboratory or clinic would function unless registered under this Act. Neither any person nor professional would be employed or work or perform any prenatal diagnostic test at a place other than a place registered under this Act (Sec 3). No person or specialist or team of specialists would conduct sex selection on a woman or man (Sec 3A). No person shall sell ultrasound or any machine or equipment capable of detecting sex of the fetus to any persons or center that is not registered under the Act (Sec 3B).

No person or place or center shall be used or caused to be used by any person for conducting prenatal diagnostic techniques except for the purposes of detection following abnormalities (Sec 4):

i) Chromosomal abnormalities;
ii) Genetic metabolic diseases;
iii) Hemoglobinopathies;
iv) Sex-linked genetic diseases;
v) Congenital anomalies;
vi) Any other abnormalities or diseases as may be specified by the Central Supervisory Board;

No persons including a relative or husband of the pregnant woman seek or encourage the conduct of any prenatal diagnostic techniques (Secs 4.4, 4.5) except in conditions where qualified persons satisfied with the following reasons (Sec 4.3) in writing:

i) Age of the pregnant woman is above 35 years;
ii) The pregnant woman has undergone two or more spontaneous abortions or fetal loss;
iii) The pregnant woman had been exposed to potentially teratogenic agents such as drugs, radiation, infection or chemicals;
iv) The pregnant woman or her spouse has a family history of mental retardation or physical deformities such as spasticity or any other genetic disease;
v) Any other condition as may be specified by the board;

No person shall conduct the prenatal diagnostic procedures unless (Sec 5.1):

a) (S)he has explained all known side and after effects of such procedures;
b) (S)he has obtained in the prescribed form her written consent to undergo such procedures in the language which she understands;
c) A copy of her written consent obtained is given to the pregnant woman.

No person shall communicate to the pregnant woman concerned or her relatives or any other person the sex of the fetus by words, signs, or in any other manner (Sec 5.1). No person shall conduct or cause to conduct in any genetic counseling center or laboratory or clinic, prenatal diagnostic techniques including ultrasonography, for the purpose of determining the sex of a fetus (Sec 6).

The central government shall constitute central supervisory board (Sec 7), and state government shall constitute a state or union territory supervisory board (16 A) to exercise the powers and perform the functions conferred on the board under this Act. The board shall consist of-

(a) The minister in charge of the ministry or department of family welfare (chairperson), ex officio,
(b) the secretary to the government in charge of the department of family welfare (Vice-chairman), ex officio,
(c) 3 members represent the ministries of Women and Child Development, Department of Legal Affair / Law and Justice, and Indian System of Medicine and Homeopathy, ex officio,
(d) The director of health services, ex officio,
(e) 10 members two each from amongst-eminent medical geneticists, eminent gynecologist and obstetrician, eminent pediatricians, eminent social scientists, and representatives of women welfare organizations,
(f) 3 women Members of parliament/legislatives,
(g) 4 members to be appointed on rotation to represent the states and the union territories, two in the alphabetical order and two in the reverse alphabetical order,
(h) An officer of the rank of Joint Secretary in charge of Family Welfare shall be the Member Secretary, ex officio.

The term of office shall be for 3 years or one year (Sec 8). Board shall meet at least once in six months (Central) or once in 4 months (State). Provisions are made for conducting proceedings, appointment and disqualification of staff or officers, filling up posts, and authentication of orders (Secs 10-13).

Functions of the Board (Sec 16) are:

1. To advice the government on policy matters relating to use of prenatal diagnostic techniques;
2. To review and monitor implementation of the Act and Rules made there under and recommend to the government changes in the said Act and Rules;
3. To create public awareness against the practice of preconception sex selection and prenatal determination of sex of fetus leading to female feticide;
4. To lay down code of conduct to be observed by persons working at genetic counseling centers, genetic laboratories and genetic clinics;

5. To oversee the performance of various bodies constituted under the Act and take appropriate steps to ensure its proper and effective implementation;
6. Any other functions as may be prescribed under the Act.

The state boards send the consolidated reports of their activities to the Central Board and Central Government. The Central Government shall appoint one or more Appropriate Authorities for each of the union territories and State Government shall appoint one or more Appropriate Authorities (Sec 17) that shall have following three members-

1. An officer of the rank of Joint Director of Health and Family Welfare as chairperson;
2. An eminent woman representing women's organizations; and
3. An officer of Law Department of the state or the union territory concerned.

The Appropriate Authority shall have following functions (Sec 17.4):

a. To grant, suspend or cancel registration of a genetic counseling center or clinic or laboratory;
b. To enforce standards prescribed for the genetic counseling center or clinic or laboratory;
c. To investigate complaints of breach of the provisions of this Act or the rules made there under and take immediate action;
d. To seek and consider the advise of the Advisory Committee constituted under subsection (5), on application for registration and on complaints for suspension or cancellation of registration; and
e. To take appropriate legal action against the use of sex selection technique by any persons at any place and also to initiate independent investigation;
f. To create public awareness against the practice of sex-selection or prenatal determination of sex;
g. To supervise the implementation of the provisions of the Act and rules;
h. To recommend to the Board and states Boards modifications required in the rules in accordance with changes in technology or social conditions; and to take action on the recommendations of the Advisory Committee made after investigation of complaint for suspension or cancellation.

Advisory Committee shall be for each Appropriate Authority appointed by the Central or the state government to aid and advise the Appropriate Authority in the discharge of its functions, and shall have following members:

a. Three medical experts from amongst gynecologists, obstetricians, pediatricians and medical geneticists;
b. One legal expert;
c. One office to represent the department dealing with information and publicity of the State Government or the Union Territory;
d. Three eminent social workers of whom not less than one shall be from amongst representatives of women's organizations.

The Advisory Committee shall have powers in respect of the following matters, namely-

a. Summoning of any person who is in possession of any information relating to violation of the provisions of this Act or the rules made thereunder;
b. Production of any document or material object relating to clause (a);
c. Issuing search warrant for any place suspected to be indulging in sex selection techniques or prenatal sex determination; and any other matter, which may be prescribed.

No person shall open any genetic counseling center, genetic laboratory or genetic clinic, including clinics, laboratory or center having ultrasound or imaging machine or scanner or any other technology capable of undertaking determination of sex of fetus and sex selection, or render services to any of them unless duly registered under the Act (Sec 18) in a prescribed forms with payment of fee.

The Appropriate Authority shall, after holding an inquiry and after satisfying itself that the applicant has complied with all the requirements of this Act, grant a certificate of registration (Sec 19). The Authority can cancel or suspend the registration on any complaint and after investigation found violation of provisions of the Act (Sec 20). The center or clinic or laboratory may, within 30 days from the date of receipt of the order of suspension or cancellation or registration passed by the Appropriate Authority an appeal against order (Sec 21).

No person, organization, clinics, laboratory or center having technology capable of undertaking

determination of sex of fetus shall publish, distribute, communicate, or caused to be issued, published, distributed or communicated any advertisement in any form including internet (Sec 22). Contravenes of this shall be punished with imprisonment for a term which may extend to 3 years and with fine which may extend to Rs. 10,000 (Sec 22 [3]).

Any medical geneticist, gynecologist, registered medical practitioner, or person who own center or employed in such center and provide his professional or technical services, and who contravene any of the provision of the Act shall be punishable with imprisonment for a term which may extend to three years and with fine which may extend to Rs.10,000 and on any subsequent conviction, with imprisonment which may extend to 5 years and with fine which may extend to Rs. 50,000. The name of such practitioner shall be reported to Appropriate Authority to the Medical Council for suspension of his registration till the case is disposed of and on conviction for removal of his name from the register of the Council for a period of 2 years for the first offence and permanently for the subsequent offence (Sec 19).

Any person including pregnant (unless she was compelled to undergo such diagnostic test) who seeks the aid of a medical or genetic professional or center for the purpose other than specified in clause (2) of section 4, shall be punished with imprisonment for a term which may extend to 3 years and with fine which may extend to Rs. 10,000 and on any subsequent conviction with imprisonment which may extend to five years and with fine which may extend to Rs.50,000. Offence by the Company or director of company shall be liable for punishment accordingly. Every offence under this Act shall be cognizable, non-bailable and noncompoundable.

Under the Sec 32 the government has power to make provision to deal with any difficulty that may arise in the implementation of this Act. According to this Act government can make rules (Sec 32) and regulation (sec 33).

There are 36477 bodies registered using ultrasound in the country and 431 ultrasound machines are sealed and 603 ongoing cases in the court as on 30.9.2009. Meetings of central supervisory board and sensitization of members of parliament are regularly taking place. Judiciary system is also activated for the Act and many sensitization workshops are held. A website on PNDT has been launched.

Save the Girl Child

Under the overall umbrella of National Health Mission (NHM) as a part of RCH II Program the critical concerns of safe mother hood, child health and reproductive health issues, (SGC) integrates the Girl child survival before & after conception through implementation of Pre-conception and Pre natal diagnostic technique Act 1994 by regulating misuse of pre-conception and pre natal diagnostic techniques for sex selection and promotion of girl child in the country. SGC is a decentralized centrally sponsored program.

Activities under the program

IEC and publicity activities

- Rallies and Signature campaigns for 'Save the Girl Child'.
- Involvement of community radio, mass media and internet for information dissemination.
- Awareness program with the help of NGOs/ MNGOs etc like Public Melas, public meetings, Jan Samvads, Jan Sunwai.
- Publicity and information material developed in regional language.
- Public messages in the public places like bus stands, railway stations, Airports, metro stations etc.
- Involvement of print and electronic media to give wider publicity to the issue like advertisement on TV relating to PNDT Act and promotional Girl child schemes in the State.
- Youth campaign against sex selection.
- Local awareness activities such as nukkad natak,dramas, folk art etc.

Strengthening the implementation of PNDT Act

- Inspection team to be put in place to ensure Regular survey
- Renewal of registrations to be taken on the basis of track record in terms of record keeping, etc of the PNDT Clinics
- Mapping of Mobile ultrasound machines in the States

- Follow-up of the cases in the court by hiring advocates at the district level.
- Ensuring Regular meetings of Sate supervisory board, state appropriate authority, state advisory committee and district advisory committee to review the progress of implementation at different levels.

Monitoring and Evaluation:

- Monitoring birth registration and Sex Ratio at birth by PRI institutions.
- Monitoring of PNDT clinics by MNGOs that will share the responsibility of inspection and monitoring of DAA.
- Identification of unregistered machines in the district by community workers.
- Monitoring of Pregnancies, MTPs, live births and Birth registrations by community workers.
- AAs has to take up medical audit of records of Form F kept by PNDT clinics under national scheme.
- NIMC and NSMC inspections to the State and District Appropriate Authority (DAAs)(Central).
- Regular review and monitoring meetings at the national level and State level in steering group and state health mission respectively for implementation of SGC scheme involving strict implementation of PNDT Act by DAAs.

Capacity building

- Training of District appropriate authorities at the State level.
- Training of Judiciary at National and State level.
- Training of NGOs or MNGOs etc
- Training of community workers like ASHAs (it has to be incorporated in their training module)
- Media workshops

Networking and Alliance Building

- Networking with NGOs working on the issue in the area
- Interaction and dialogue with medical professionals.
- Networking with women and child development department/ or social welfare departments for the promotional schemes of Girl child.
- Networking with schools, colleges, professional colleges and universities to promote the youth campaign.

Reporting and Documentation

- AAs has to ensure the complete maintenance of records by the PNDT Clinics.
- All the updated information to be communicated in specified format by the centre.
- Inspection reports of national and State teams should be reported and documented regularly.
- Manufactures need to send the report of their sales to the Centre and concerned State and Information Bank of Sale of all machines to be recorded and documented.
- All the information like list of registered clinics, details of court cases, mobile units should be put in public domain by printing Annual Report and putting it on line as per the Act.

Research, innovations and others

- State can take up any Research Study related to the issue in their areas.
- State can take up any other area specific activities as per need.

Funding

- Resources should be given to the States by the Centre in Centrally Sponsored Schemes/ Projects like Member of Parliament scheme, Grant in aid to NGOs, Medical audit,
- The State can utilize the funds under RCH II felxi-pool Budget for the specified activities and human resources besides National Schemes.
- Registration fee collected under PNDT Act be utilized for implement union of the PC&PNDT Act.
- Funds will be routed through State Health Society and District Health Society.

Human Resource Requirement At Three Levels

- At the National level National PNDT cell need to formulate for national coordination of activities.

- At the State level States should formulate State PNDT cell to coordinate the activities under SGC program and PNDT implementation and facilitate State Plan for SGC program on the basis of District Plans.
- At the District level a District PNDT coordinator to look after SGC program and facilitate District Plan for the SGC Program. An advocate to look into PNDT cases at District level.

COMMENTS

The Census 2001 reported the most disturbing and alarming aspects of sharp fall in sex ratio of children (0-6 year) from 945 in 1991 to 927 in 2001. Punjab (793), Haryana 820, Delhi 865, Gujarat 878 are the worst states. These ratios further disturbed in 2011 cebsus (Table 71.1). In spite of the stringent law under implementation for last two decades and hundrds of prosecutions being launched and doctors being sent to jails there is no improvement in sex ratio. This indicates that mere enactment of Act is not enough. It needs involvement of people, and serious efforts to implement legislation (Census of India 2001, 2011). A Central Supervisory Board (CSB) has been constituted under the chairmanship of Minister of Health & Family Welfare. The Supreme Court of India is monitoring the implementation of this Act. CSB has constituted two more subcommunities to give more teeth to the Act, for better implementation. Many mass awareness programs have been started to highlight the adverse sex ratio and provision of the Act. Further large number of complaints are filed in the courts/policy against violators of the Law and many ultrasound machines are sealed and seized.

Table 71.1

India high focus States	Census year				Decline in 2011 over 2001	Decline in 2011 over 1991	Decline in 2011 over 1981
	1981	1991	2001	2011			
All India	962	945	927	914	13	31	48
Haryana	902	879	819	830	11	49	72
Himachal pradesh	971	951	896	906	+10	45	65
Punjab	908	875	798	846	+48	29	62
Rajasthan	954	916	909	883	26	33	71
Gujrat	947	928	883	886	+3	42	61
Chandigarh	907	899	845	867	+22	32	40
Delhi	926	915	868	867	01	48	59

On one side need of more aggressive efforts are recommended to implement the Act, on other sides such aggression could lead to more illegal activities going underground. This has been elaborated by health professionals in one of the workshops in New Delhi (Reference kept secret).

Recent activism of media that has exposed many well known gynecologists and practitioners in various cities of India for their practices of female feticides indicates seriousness of problem. Many social groups have raised their voice against medical professionals and blaming that the whole problem of female feticide is because of unethical practice of doctors. This is partly true because various other reasons are responsible for female feticide which are never given due priority (Kishore 2005). Sometime media report of expressing alternative views by politicians and professionals against the ban of PNDT send wrong message in the society (BMJ 2016).

Beti Bachao Beti Padhao (BBBP)

Government of India has introduced the Beti Bachao, Beti Padhao (BBBP) scheme for survival, protection & education of the girl child. It aims to address the issue of declining Child Sex Ratio (CSR) through a mass campaign across the country targeted at changing societal mindsets & creating awareness about the criticality of the issue. The Scheme will have focussed intervention & multi-sectoral action in 100 districts with low Child Sex Ratio.

The criteria/norms for selection/identification of 100 districts under the Beti Bachao Beti Padao program are as under:-

i) 87 Districts have been selected from 23 States/ UTs having Child Sex Ratio below the National average of 918.
ii) 8 Districts have been selected from 8 States/UTs having Child Sex Ratio above National average of 918 but showing declining trend
iii) 5 Districts have been selected from 5 States/UTs having Child Sex Ratio above National average of 918 and showing improving trend so that other parts of country can learn from them.

It is a joint initiative of Ministry of Women and Child Development, Ministry of Health and Family Welfare and Ministry of Human Resource Development. The

- At the State level States should formulate State PNDT cell to coordinate the activities under SGC program and PNDT implementation and facilitate State Plan for SGC program on the basis of District Plans.
- At the District level a District PNDT coordinator to look after SGC program and facilitate District Plan for the SGC Program. An advocate to look into PNDT cases at District level.

COMMENTS

The Census 2001 reported the most disturbing and alarming aspects of sharp fall in sex ratio of children (0-6 year) from 945 in 1991 to 927 in 2001. Punjab (793), Haryana 820, Delhi 865, Gujarat 878 are the worst states. These ratios further disturbed in 2011 cebsus (Table 71.1). In spite of the stringent law under implementation for last two decades and hundrds of prosecutions being launched and doctors being sent to jails there is no improvement in sex ratio. This indicates that mere enactment of Act is not enough. It needs involvement of people, and serious efforts to implement legislation (Census of India 2001, 2011). A Central Supervisory Board (CSB) has been constituted under the chairmanship of Minister of Health & Family Welfare. The Supreme Court of India is monitoring the implementation of this Act. CSB has constituted two more subcommunities to give more teeth to the Act, for better implementation. Many mass awareness programs have been started to highlight the adverse sex ratio and provision of the Act. Further large number of complaints are filed in the courts/policy against violators of the Law and many ultrasound machines are sealed and seized.

Table 71.1

India high focus States	Census year				Decline in 2011 over 2001	Decline in 2011 over 1991	Decline in 2011 over 1981
	1981	1991	2001	2011			
All India	962	945	927	914	13	31	48
Haryana	902	879	819	830	11	49	72
Himachal pradesh	971	951	896	906	+10	45	65
Punjab	908	875	798	846	+48	29	62
Rajasthan	954	916	909	883	26	33	71
Gujrat	947	928	883	886	+3	42	61
Chandigarh	907	899	845	867	+22	32	40
Delhi	926	915	868	867	01	48	59

On one side need of more aggressive efforts are recommended to implement the Act, on other sides such aggression could lead to more illegal activities going underground. This has been elaborated by health professionals in one of the workshops in New Delhi (Reference kept secret).

Recent activism of media that has exposed many well known gynecologists and practitioners in various cities of India for their practices of female feticides indicates seriousness of problem. Many social groups have raised their voice against medical professionals and blaming that the whole problem of female feticide is because of unethical practice of doctors. This is partly true because various other reasons are responsible for female feticide which are never given due priority (Kishore 2005). Sometime media report of expressing alternative views by politicians and professionals against the ban of PNDT send wrong message in the society (BMJ 2016).

Beti Bachao Beti Padhao (BBBP)

Government of India has introduced the Beti Bachao, Beti Padhao (BBBP) scheme for survival, protection & education of the girl child. It aims to address the issue of declining Child Sex Ratio (CSR) through a mass campaign across the country targeted at changing societal mindsets & creating awareness about the criticality of the issue. The Scheme will have focussed intervention & multi-sectoral action in 100 districts with low Child Sex Ratio.

The criteria/norms for selection/identification of 100 districts under the Beti Bachao Beti Padao program are as under:-

i) 87 Districts have been selected from 23 States/ UTs having Child Sex Ratio below the National average of 918.
ii) 8 Districts have been selected from 8 States/UTs having Child Sex Ratio above National average of 918 but showing declining trend
iii) 5 Districts have been selected from 5 States/UTs having Child Sex Ratio above National average of 918 and showing improving trend so that other parts of country can learn from them.

It is a joint initiative of Ministry of Women and Child Development, Ministry of Health and Family Welfare and Ministry of Human Resource Development. The

Sectoral interventions under the programme include the following:

i) Ministry of WCD: Promote registration of pregnancies in first trimester in AnganwadiCentres (AWCs); Undertake Training of stakeholders; Community Mobilization & Sensitization; Involvement of Gender Champions; Reward & recognition of institutions & frontline workers.

ii) Ministry of Health & Family Welfare: Monitor implementation of Pre-Conception and Pre-Natal Diagnostic Techniques (PCP&DT)Act, 1994; Increased institutional deliveries; Registration of births; Strengthening PNDT Cells; Setting up Monitoring Committees.

iii) Ministry of Human Resource Development: Universal enrolment of girls; Decreased drop-out rate; Girl Child friendly standards in schools; Strict implementation of Right to Education (RTE); Construction of Functional Toilets for girls.

As the Beti Bachao, Beti Padhao (BBBP) scheme has been approved recently, no fund allocation has been made so far to the States.

THE INFANT MILK SUBSTITUTES, FEEDING BOTTLES AND INFANT FOODS (REGULATION OF PRODUCTION, SUPPLY & DISTRIBUTION) ACT, 1992

Infants partially breast fed (breast milk along with animal milk or infant formula) or not breast bed have a significantly higher risk of hospitalization and death as compared to infants predominantly breast fed (breast milk and water) or exclusively breast fed (Bahl et al 2005). Data from Indian states that only 55% of children less than 4 months of age are exclusively breast fed, 23% predominantly breast fed and 20% receive supplements along with breast milk. Powered milk is given infrequently to young children at any age, but other milk (such as cow's/buffalo's children is given more often. Enterobacter Sakazakii in powered infant formula has been implicated in outbreaks causing sepsis, meningitis or necrotizing enterocolitis (van Acker et al 2001; Simmons et al 1989). Powered milk has also been shown to cause infections by Clostridium botulinum, S. aureus and Salmonella (WHO 2004). The risk of potentially fatal infections appears to be highest for low birth weight infants, immunocompromized infants at any age and term infants hospitalized in level 2 and level 3 neonatal intensive care units. Keeping these facts in mind this legislation is very important.

This Act is to provide for the regulation of production, supply and distribution of infant milk substitutes, feeding bottles and infant foods with a view to the protection and promotion of breast feeding and ensuring the proper use of Infant Foods and for matters connected therewith or incidental thereto. This act is applied to the whole of India (Sec 1). Various terms are defined in section 2.

According to section 3, no person shall advertise, take part in promotion of use or sale, supply of or donate or distribute infant milk substitutes or feeding bottles, or give an impression or create a belief in any manner that feeding of infant milk substitutes is equivalent to or better than mother's milk. Section 6 gave direction that such container of infant foods and milk substitutes must affix label clearly written in local language that "Mother's milk is best for your baby", "should be used only on the advice of a health worker", "a warning sign if used replacing mother's milk".

No picture of baby or mother shall be depicted on the containers. Beside this all details about the manufacturing date, batch number, expiry date, compositions, etc. should also be written and must follow the instructions and guidelines given under the Prevention of Food Adulteration Act 1954 (Sec 11). All educational material whether audio, or visual shall contain the content of benefits of, and superiority of breast feeding (Sec 7). No person other than health workers or institutions demonstrate the need and feeding of milk substitutes (Sec 8). Food inspector working under Prevention of Food Adulteration Act or any authorized person shall be responsible for inspection or seizing activities if he/she finds that there is violation of this Act.
Any person who contravenes the provisions of various sections shall be punishable with imprisonment for a term which may extend to three years, or with fine which may extend to five thousand rupee, or with both.

Following voluntary organizations are notified where a complaint in writing can be made:

1. Central Social Welfare Board, Samaj Kalyan Bhawan, B-12 Tara Cresent, Institutional Area, South of IIT, New Delhi 110 016
2. Indian Council for Child Welfare, 4, Deen Dayal Upadhyaya Marg, New Delhi-110 002
3. Association for Consumer Action of Safety & Health (ACASH), Room No. 21, Lawyer's Chambers, Bombay 400 002.
4. Breastfeeding Promotion Network of India (BPNI) BP-33 Pitampura, New Delhi 110088.

The power conferred under the Subsection 3 of Section 1 of the Infant Milk Substitutes Feeding Bottles and Infant Foods (Regulation of Production, supply and Distribution) Act 1992, the Central Government formulated Rules in which the following provisions are given:

1) authorized person has been specifically mentioned that he should be medical doctor (Sec 4).
2) guidelines for breast feeding.

THE JUVENILE JUSTICE (CARE & PROTECTION OF CHILDREN) ACT, 2000 [56 of 2000]

The new Act replaced the old Juvenile Justice Act 1986. This Act is in consonance with India's human rights obligations under the United Nations' Convention of the Rights of the Child which is held in November 1989. Several provisions of the Constitution including clause (3) of article 15, Clauses (e) and (f) of article 39, articles 45, and 47 also impose on the state a primary responsibility of ensuring that all the needs of children are met and that their basic human rights are fully protected. The convention emphasizes social reintegration of child victims, to the extent possible, without restoring to judicial proceedings. The government of India has rectified the convention, has found it expedient to re-enact the existing law relating to juveniles bearing in mind the standards prescribed in the Convention on the Rights of the Child, the United Nations Standard Minimum Rules for the Administration of Juvenile Justice, 1985 (The Beijing Rules), the United Nations Rules for the protection of Juveniles Deprived for their liberty (1990), and all the other relevant international instruments. To achieve this objective the Act was enacted.

In the Act, Juvenile or child means who has not attained the age of 18 years. Neglected juvenile means a juvenile who - i) is begging, ii) suffering from, terminal or incurable diseases and having no one to support or look after; iii) who is being abused or exploited, or iv) destitute. Delinquent juvenile means a juvenile who has found to have committed an offense.

It is the responsibility of state to look into the problem of juvenile social maladjustment and make special efforts to mobilize all possible resources of the family, the community, and social organization for rehabilitation and betterment of juvenile future. Any juvenile, who is likely to be abused, exploited and inducted into criminogenic life and is in need of legal support to be appropriately rehabilitated.

Apart from prohibiting the confinement of the juvenile in a police lockup or jail, his/her contact with the police has been reduced to the minimum. For this such child would be produced by police officer to the special juvenile police unit or childlines or NGOs, or by public-spirited citizens authorized by the state, before the Child Welfare Committee. The delinquents are to be dealt with the Juvenile Court. Criteria for admission in Juvenile Homes, Observation Homes, Special Homes, transfer, and criteria for Board setting up, selection of members or magistrate have been defined in the Act. Criteria for setting up of social organization or institution for child welfare are also defined by the Act. State Governments have been empowered to establish and maintain either by themselves or in association with the voluntary organizations, children's homes in every district or a group of districts for the reception of child in need of care and protection during the pendency of any inquiry and subsequent for their care, treatment, education, training, development and rehabilitation (Sec 33 & 34).

Where a child is found to be suffering from leprosy, STDs, Hepatitis B, Open case of Tuberculosis, and other such diseases or is of unsound minds, s(he) shall be dealt with separately through various specialized referral services or under the relevant laws as such (Secs 56-58).

The Act provides a system to facilitate the adoption of children (Sec 41). The Act contemplate adoptions, as a manner of rehabilitation of children who are orphaned, abandoned and abused. It also contemplates foster care (Sec 42), sponsorship (Sec 43) and aftercare organizations (Sec 44) as models of rehabilitation and 'reintegration' into society.

The Act is not providing system to empower children. Rights to make choices and participate in societal processes are not respected in Acts. There was media and society outcry to decrease the age of Juvenile from 18 to 16 in case of heinous crimes. The Juvenile Justice (Care and Protection of Children) Bill, 2014 was prepared and introduced in Indian The Juvenile Justice (Care and Protection of Children) Bill, 2014, Parliament, As the juvenile justice system is based on the principle of restorative justice, such children during their stay in a 'place of safety' will be provided with reformative measures such as education, health, nutrition, de-addiction, treatment of diseases, vocational training, skill development, life skill education and counseling. But age issue remained a controvercial.

THE CHILD LABOR (PROHIBITION AND REGULATION) ACT, 1986

BURDEN OF PROBLEM

UNICEF considered a child as exploited if he/she is put on work. Human Development Report of United Nation Development Program has stated that more than 10% of labor force constitutes children in India, which is much above the world average of 6%. According to International Labor Organization (ILO) report (1979), as many as 1/3rd rural children aged between 10 and 14 year and 1/8th of the urban children are at work in India. The Census of India reported 13.7 million children whereas the Planning Commission reported around 17 million children are working in the country. According to Labor Ministry 12,19740 children are working in hazardous industries. It is certain that large number of children engaged in domestic, non-wage earning work is totally excluded from such calculations. According to an estimate 185595 children are engaged as domestic help and in dhabas and 49893 children work in autorepair workshops. However, child labor contributes to 20% of India's GNP. It is also reported that the number of child labor is as high as 55-100 million that is equal to the number of unemployed adults in the country.

Child labor has been observed in agriculture, plantation, mining and quarrying, *biddi* making, glass and bangles making, handloom and carpet weaving, *zari* and embroidery, gem cutting and polishing, match and fire work, cashew processing and manufacturing of coir products, forestry, livestock, fisheries, brick-kilns construction, domestic work, hotels, and tea-stalls. Child labor is also involved in marginal work e.g. selling newspaper, shoe-shining, looking after cars, garbage collection and sorting out object from garbage. Child suffers from poor mental, physical, and social development. Child may start adopting the habits, which are associated with adults like smoking and going to the commercial sex workers. Poor and unsafe working conditions adversely affect these children more than adult. Constant physical efforts may cause repeated injuries to the tender muscles and may lead to permanent disability.

Child Labor Cell

Child labor cell is formed under the Ministry of labor which is responsible for funding and monitoring of the various projects. The cell also provides financial assistance to voluntary organizations for taking up action oriented projects for prevention of child labor. In addition, cell monitors the enforcement of Child Labor Act 1986 and organizes meetings, workshops and advise the boards.

National Child Labor Project

One of the components of the National Child Labor Policy 1987, is setting up of the National Child Labor Projects in areas of high concentration of child labor for their identification, withdrawal and rehabilitation. The package of benefits to child labor for their rehabilitation include special schools/rehabilitation centers, non-formal/formal education, mid-day meal, vocational training, nutrition, health care, stipend of Rs. 100 per child per month, etc. The other activities include more strict enforcement of child labor related laws, raising awareness against the evil of child labor and extension of child welfare facilities to the child labor.

The National Child Labor Projects are operational in 250 districts which is going to be extended to all districts. In 9th Plan Rs. 250 crore were given for 100 districts, and in 10th plan Rs. 604 crore were given for 250 districts. The government has demanded more funds to cover all the districts (600) in the country (HT 14th Nov 2006). Presently 15 occupations and 57 processes being hazardous are banned for employment of children.

CHILD LABOR (PROHIBITION AND REGULATION) ACT [Act No. 61 of Year 1986]

The Child Labor (Prohibition and Regulation) Act is to prohibit the engagement of children in certain employments and to regulate the conditions of work of children in certain other employments. It extends to the whole of India. This Act defines (sec 2) certain terms: "child' means a person who has not completed his 14 year of age; "adolescent" means a person who has completed his fourteenth year of age but has not completed his eighteenth year; "family", in relation to an occupier, means the individual, the wife or husband, as the case may be, of such individual, and their children, brother or sister of such individual; and "occupier", in relation to an establishment or a workshop, means the person who has the ultimate control over the affairs of the establishment or workshop. Age of 14 years for child differs from one Act to another and needs to be clarified and should be conformed in all legislations.

No child shall be employed or permitted to work in any of the occupations set forth in Part A of the Schedule or in any workshop wherein any of the processes set forth in Part B of the Schedule is carried on (Sec 3) except an aid of his family or to any school established by government. *It is illegal to employ children below 14 year for domestic work or as domestic servant, or in dhabas (road side eateries), restaurants, hotels, motels, tea-shops, resorts, spas and other recreational centers* (These occupations are hazardous for children according to New Amendment 2006 and effected from 10th October 2006). The Central Government may constitute an advisory committee to be called the Child Labor Technical Advisory Committee to advise the Central Government (Sec 5).

No child shall work for more than three hours followed by an interval of rest for at least one hour and that it shall not be spread over more than six hours. No child shall be permitted or required to work between 7 pm. and 8 p.m. No child shall be required or permitted to work overtime (Sec 7).

Every child employed in an establishment shall be allowed in each week, a holiday of one whole day, which day shall be specified by the occupier in a notice permanently exhibited in a conspicuous place in the establishment and the day so specified shall not be altered by the occupier more than once in three months.

Every occupier of establishment in which a child is employed shall, within a period of thirty days from such commencement, send to the Inspector, a written notice about the child (sec 9). In case of dispute of the age of child the Inspector may ask for age certificate granted by the prescribed medical authority (Sec 10). The occupier shall maintain the record in a register, which shall be made available for inspection (Sec 11).

It is the responsibility of appropriate government to make rules to provide healthy and safe environment and conditions for the child on work such as disposal of wastes and effluents, ventilations, temperature, lighting, cleanliness, drinking water, latrine, urinals, fencing of machinery, employment of children on dangerous machines, instructions, training and supervision in relation to employment of children on dangerous machines, etc. (Sec 12).

Whoever employs any child or permits any child to work in contravention of the provisions of section 3 shall be punishable with imprisonment for a term which shall not be less than three months but which may extend to one year or with fine which shall not be less than ten thousand rupees but which may extend to twenty thousand rupees or with both. On subsequent offence he shall be punishable with imprisonment for a term which shall not be less than six months but which may extend to two years (Sec 14). The honorable Supreme Court of India has directed that an amount of Rs. 20000 be recovered from the employer for the rehabilitation of the child. This amount is an addition to the penalties prescribed under the Act.

SCHEDULE [Section 3] PART A: OCCUPATIONS

Any occupation connected with-

(1) Transport of passengers, goods or mails by railway
(2) Cinder picking, clearing of an ash pit or building operation in the railway premises;
(3) Work in a catering establishment at a railway station,

involving the movement of a vendor or any other employee of the establishment from one platform to another or into or out of a moving train;

(4) Work relating to the construction of a railway station or with any other work where such work is done in close proximity to or between the railway lines;

(5) A port authority within the limits of any port;

(6) Work relating to selling of crackers and fire works, Abattoirs, slaughter houses

PART B: PROCESSES

(1) Bidi-making; (2) Carpet weaving; (3) Cement manufacture, including bagging of cement; (4) Cloth printing, dying and weaving; (5) Manufacture of matches, explosives and fire works; (6) Mica cutting and splitting; (7) Shellac manufacture; (8) Soap manufacture; (9) Tanning; (10) Wool cleaning; (11) Building and construction industry; (12) Manufacture of sate pencils (including packing); (13) Manufacture of products from agate; (14) Manufacturing processes using toxic metals and substances such a lead, mercury, manganese, chromium, cadmium, benzene, pesticides and asbestos; (15) Hazardous processes' as defined in section 2 and "dangerous operations" as notified in rules made under section 87 of the Factories Act, 1948 (63 of 1948); (16) Printing as defined in section 2 of the Factories Act, 1948 (63 of 1948); (17) Cashew and cashew nut descaling and processing; (18) Soldering processes in electronic industries.

COMMENTS

Inspite of number of legislations and official orders children are the victim of modernization, industrialization, and humanism. From time to time reports are appearing in national and international news dailies regarding child labor in hazardous occupations. These are enough evidences for negligence and non-seriousness of the government for vulnerable children. According to one unpublished study 9 million children are engaged in various works in mines (Hindustan 2010).

THE PROHIBITION OF CHILD MARRIAGE ACT 2006

Prevalence of child marriage (below 18 years) in India is 47%. However, it is as high as 75% in Niger, 72% in Chad, 41% in Nepal and all are developing and low income countries. Child marriage is associated with high maternal and child mortaility, malnutrition, anemia, poor growth the the baby and many others. Most of the time it is a social problem therefore punitive actions are required to curb this problem.

An Act to provide for the prohibition of solemnisation of child marriages has been enacted. The Child Marriage Restraint Act, 1929 is hereby repealed. Child means a person who, if a male, has not completed twenty-one years of age, and if a female, has not completed eighteen years of age. Where a child contracts a child marriage, any person having charge of the child, whether as parent or guardian or any other person or in any other capacity, lawful or unlawful, including any member of an organisation or association of persons who does any act to promote the marriage or permits it to be sotemnised, or negligently fails to prevent it from being solemnised, including attending or participating in a child marriage, shall be punishable with rigorous imprisonment which may extend to two years and shall also be liable to fine which may extend up to one lakh rupees: Provided that no woman shall be punishable with imprisonment.

The State Government may also request a respectable member of the locality with a record of social service or an officer ofthe Gram Panchayat or Municipality or an officer of the Government or any public sector undertaking or an office bearer.of any non-governmental organisation to assist the Child Marriage Prohibition Officer and such member, officer or office bearer, as the case may be, shall be bound to act accordingly.

It shall be the duty ofthe Child Marriage Prohibition Officer:

a) to prevent solemnisation of child marriages by taking such action as he may deem fit;

b) to collect evidence for the effective prosecution of persons contravening the provisions of this Act;

lc) to advise either individual cases or counsel the residents of the locality generally not to indulge in promoting, helping, aiding or allowing the solemnisation of child marriages;

(d) to create awareness of the evil which results from child marriages;

(e) to sensitize the community on the issue of child marriages;

(f) to furnish such periodical returns and statistics as the State Government may direct; and

(g) to discharge such other functions and duties as may be assigned to him by the State Government.

COMMENTS

The child marriage is a social evil as perceived by civilized society. However, such marriages are still common in Rajasthan and Madhya Pradesh and usually

get approval from political, religious and social systems. It must be understood that legal prohibition is not sufficient to prevent such evils to happen till the society realize its bad impact on the human development. Age of child marriage is also differs from other Acts such as the Juvenile Justice Act, the Child Labor (Prohibition) Act, Railways Act, etc. and needs to be clarified and should be conformed or specified with reasons in all legislations.

Child Abuse and maltreatment constitutes all forms of physical and/ or emotional illustration sexual abuse, neglected or negligent treatment or commercial or other exploitation resulting in actual or potential harms to the child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power (Kishore 2007). Child marriage and child labor should be considered as child abuse.

THE PROTECTION OF CHILDREN FROM SEXUAL OFFENCES ACT 2012

The Protection of Children from Sexual Offences Act, 2012 has been drafted to strengthen the legal provisions for the protection of children from sexual abuse and exploitation. For the first time, a special law has been passed to address the issue of sexual offences against children.

Sexual offences are currently covered under different sections of IPC. The IPC does not provide for all types of sexual offences against children and, more importantly, does not distinguish between adult and child victims.

The Protection of Children from Sexual Offences Act, 2012 defines a child as any person below the age of 18 years and provides protection to all children under the age of 18 years from the offences of sexual assault, sexual harassment and pornography. These offences have been clearly defined for the first time in law. The Act provides for stringent punishments, which have been graded as per the gravity of the offence. The punishments range from simple to rigorous imprisonment of varying periods. There is also provision for fine, which is to be decided by the Court.

An offence is treated as "aggravated" when committed by a person in a position of trust or authority of child such as a member of security forces, police officer, public servant, etc.

Punishments for Offences covered in the Act are:

- Penetrative Sexual Assault (Section 3) – Not less than seven years which may extend to imprisonment for life, and fine (Section 4)
- Aggravated Penetrative Sexual Assault (Section 5) – Not less than ten years which may extend to imprisonment for life, and fine (Section 6)
- Sexual Assault (Section 7) – Not less than three years which may extend to five years, and fine (Section 8)
- Aggravated Sexual Assault (Section 9) – Not less than five years which may extend to seven years, and fine (Section 10)
- Sexual Harassment of the Child (Section 11) – Three years and fine (Section 12)
- Use of Child for Pornographic Purposes (Section 13) – Five years and fine and in the event of subsequent conviction, seven years and fine (Section 14 (1))

The Act provides for the establishment of Special Courts for trial of offences under the Act, keeping the best interest of the child as of paramount importance at every stage of the judicial process. The Act incorporates child friendly procedures for reporting, recording of evidence, investigation and trial of offences. These include:

- Recording the statement of the child at the residence of the child or at the place of his choice, preferably by a woman police officer not below the rank of sub-inspector
- No child to be detained in the police station in the night for any reason.
- Police officer to not be in uniform while recording the statement of the child
- The statement of the child to be recorded as spoken by the child
- Assistance of an interpreter or translator or an expert as per the need of the child
- Assistance of special educator or any person familiar with the manner of communication of

CHAPTER 72

LEGISLATION FOR OLDER PERSONS

CONSTITUTIONAL PROVISIONS

According to various clauses of the constitutional of India, certain rights are given:

- Item 9 of the State list and items 20, 23, and 24 of the concurrent list related to provision of old age pension, social security, social insurance, economic and social planning and relief to the disabled and the unemployed.
- Article 41, Directive Principles of State Policy has particular relevance to old age social security. It directs that the State shall "make effective provision for securing the rights to work, to education and to public assistance in case of unemployment, old age, sickness and disableness, and in other cases of underserved want, within its limits of economic development and capacity". It also reinforced that every person having sufficient means is required to provide for his parents who are unable to maintain themselves.
- Section 20 (2) of the Hindu Adoption and Maintenance Act 1956 makes it obligatory on the part of the person to maintain his aged or inform parents.
- Article 39 (a) adequate means of livelihood; (b) right to ownership and control of material resources to subserve common good; (c) ensures equal pay for equal work; (e) citizens not being forced by economic necessity to enter a vocation unsuited to their age or strength.
- Article 47-raising the level of nutrition and the standard of living of its people and improvement of public health. the concurrent list covers social security, social insurance, employment, invalidity, and old age pension.

Legal Provisions

- Section 88 B of Finance Act 1992 (Income Tax Act 1961) provides rebate of income tax to senior citizens who have attained the age of 65 years.
- Delhi Rent Control Act 1995 provides right to recover immediate possession of premises to accrue to members of the armed forces, central government and state government employees.
- The Hon'ble Chief Justice of India has advised Chief Justices of all High Courts in the country to accord priority to cases involving older persons and ensures their expeditious disposal.

THE MAINTENANCE AND WELFARE OF PARENTS AND SENIOR CITIZENS ACT 2007

The aim of this act is to provide guaranteed services for the maintenance and welfare of parents and senior citizens. It extend to whole India except J&K. Children defined as son, daughter, grand son and grant daughter but should not be minor. Maintenance is provision for food, clothing, residence and medical attendance and treatment. Parents are father or mother where biological, adoptive or step father or step mother whether the parents are senior citizen (more than 60

years) or not. If they can not sustain themselves in terms of food, clothing and residence from their income (pension, income from property) then the children must provide. Such parents can apply to the tribunal regarding the complaint against the children and tribunal can asked the children to give monthly allowance even if the court has not settled the case. Failing which the tribunal can issue the warrants or impose fine or imprison for a month. The monthly allowance may not be more than Rs. 10,000. State governments are asked to open old age homes. State must ensure in all government funded or aided hospitals to provide special services for senior citizens such as separate lines, separate clinics, special priority for beds for admission, more research work on diseases of older person.

OTHERS PROVISIONS

1. Under the National Old Age Pension Scheme (NOAP) central assistance of Rs. 200 for poor, destitute and infirm persons above the age of 65 years, This scheme is implemented in state and UTs through Panchayat and Municipalities and rates may range from Rs.50-150 or even more such as Delhi where old age penson is Rs. 1000.
2. This With the financial assistance, Agewell Foundation an NGO of Delhi has started a Helpline for older persons from April, 1999.
3. Life Insurance Corporation has announced policies under pension plan such as New Jeevan Dhara 1, New Jeevan Suraksha 1 and under annuity plan such as New Jeevan Akshay II. Varishtha Pension Bima Yojana is a government subsidized scheme announced for Indian citizens aged 55 years and above.
4. Indian Railways provide 30% concession in all classes and trains including Rajdhani/Shatabdi for citizens who have attained a minimum age of 60 years. Provisions are there to provide lower births to senior citizens. Separate reservation counters and reservation of seats in train are also provided. 50% discount on the basic fare for travel in economic class only in Indian Airlines, Air Sahara and Jet Airways for senior citizens of above 65 years and Indian Airlines give this discount to women who is above 63 years. Monthly bus passes in Delhi, Maharashtra and Rajasthan transport corporation given concessions. In Punjab women more than 60 years can travel free in buses.
5. The Department of Telecommunications has already announced the government decision to give telephone connections to senior citizens aged 65 years and above on priority basis.
6. ***National Institute of Social Defence (NISD),*** a subordinate office of this Ministry has initiated several training programs for the care of older persons. The NISD has launched the project 'NICE' National Instiative on Care for Elderly) in 2000. It also envisages 1 year PG diploma course and 6 months certificate course under NICE to meet the demand for care givers. In addition, short term training courses varying 5 days to 1 month for skill upgradation are also run.
7. The Ministry of Health has issued instructions to all the state governments to provide separate queues for older persons in hospitals at every stage. Special clinics are also opened in various hospitals to handle geriatric cases. Free intra-ocular Lens (IOL) are given for cataract surgery in some states. Mobile medicare unit program is implemented in some states by Helpage India.
8. Mediclaim is a Medical Insurance Scheme which is available to the person aged between the age of 5 years and 80 years. The cover provides for reimbursement of medical expenses incurred by an individual towards hospitalization/domiciliary treatment for illness, injury or disease contracted or sustained during the period of insurance. The group medi-claim policy is available to any group/ association/institution/corporate body of more than 100 persons provided it has a central administration point.
9. Jan Arogya: is a scheme primarily for the larger segment of the population with age limit of 70 years who can not afford the high cost of medical treatment. The limit of cover per person is Rs. 5000 per annum. The cover provides reimbursement of medical expenses incurred by an individual towards hospitalization of domiciliary treatment for any illness, injury or disease contracted or sustained during the period of insurance.
10. Annapurna scheme: 10 kg of rice/wheat is given to all elderly in BPL.
11. Tax rebate: certain percentage is fixed every year which is exempted from Income tax.

12. Banks are providing 0.5-1% additional interest to people >65 years on fixed deposite.
13. Reverse mortgage system for senior citizens to extract value of their property and lead a hassle free life by securing a regular income as loan against their existing property.
14. Many of the government and public hospitals have started memory clinics, mental health programs to facilitate proper disease of dementia.

COMMENTS

- Pension amount is not adequate to meet the basic requirement of the elderly and need to be increased according to inflation rate and general cost of living.
- Develop model multipurpose day care centers that could be used not only to take care of elderly people, but also be used as centers for skills development and income generation activities.
- National Commission on Older Persons should be set up to solve many issues coming in day to day practice and take up the issue such as increasing the Retirement age in view of increase in life expectancy.
- Budgetary allocation is low for elderly particularly is relation to the health security. Health Professionals are not oriented to the need of geriatric population at PHC or CHC. More health insurance is needed for elderly. Private sector should come forward to take up the health care and social security of elderly.

CHAPTER 73

LEGISLATION RELATED TO THE WELFARE AND REHABILITATION OF DISADVANTAGED

Constitutional Provision

The Constitution of India ensures equality, freedom, justice and dignity of all individuals and implicitly mandates an inclusive society for all including persons with disabilities. In the recent years, there have been vast and positive changes in the perception of the society towards persons with disabilities. It has been realized that a majority of persons with disabilities can lead a better quality of life if they have equal opportunities and effective access to rehabilitation measures.

The Government of India has enacted three legislations for persons with disabilities:

(i) Persons with Disability (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995, which provides for education, employment, creation of barrier free environment, social security, etc.

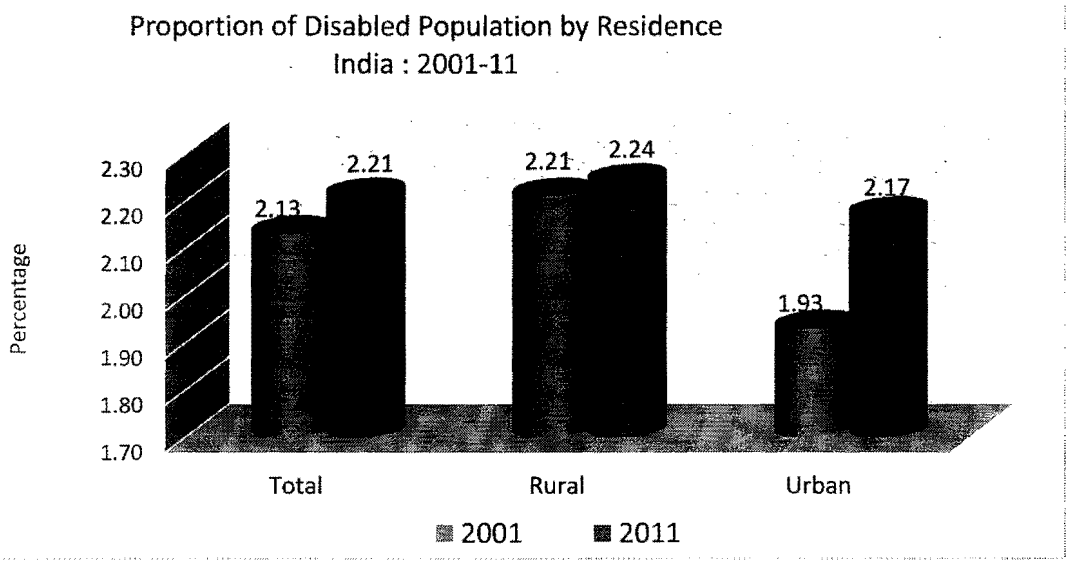
(ii) National Trust for Welfare of Persons with Autism, Cerebral Palsy, Mental Retardation and Multiple Disability Act, 1999 has provisions for legal guardianship of the four categories and creation of enabling environment for as much independent living as possible.

(iii) Rehabilitation Council of India Act, 1992 deals with the development of manpower for providing rehabilitation services.

THE PERSONS WITH DISABILITIES (EQUAL OPPORTUNITY, PROTECTION OF RIGHTS AND FULL PARTICIPATION) ACT, 1995

The National Sample Survey Organization (NSSO) in 1991, conducted a nationwide survey and covered 4 types of disabilities - (1) visual disabilities, (2) hearing disabilities, (3) speech disabilities, (4) locomotor disabilities. The survey detected about 16.15 million people (i.e., 1.9% of the total population, Urban 1.6% and Rural 2%) with one or other of the 4 types of above mentioned disabilities. On the basis of these findings central government launched a commitment to prevent and treatment of disabilities and rehabilitation of such persons.

The Persons with Disabilities Act, was passed in the winter session of the parliament in 1995 and has come into enforcement on 7th February 1996. The Act gives fundamental rights to all disabled people in the country for the equal opportunity. The Act provides for both preventive and promotive aspect of rehabilitation like education, employment and vocational training, research, manpower development, creation of barrier free environment, reservation, rehabilitation of persons with disability, unemployment allowance for the disabled, special insurance scheme for the disabled employees and establishment of homes, etc.



The Act contains 14 chapters and 74 clauses. The Act defines disability as means -

- Blindness;
- Low vision;
- Leprosy-cured;
- Hearing impairment;
- Locomotor disability;
- Mental retardation;
- Mental illness;

Disabled person is one who is suffering from not less than 40% percent of any of the disability as certified by a medical authority.

There is a provision in the Act to create a central level and state level coordination committees and an Executive Committee. The main functions of these committees are to develop policies, to review and coordinate the activities of government and NGOs and to evaluate the programs and policies for the disabled. The Act provides direction to the government and local bodies for following activities:

1. **Prevention and early detection of disabilities**
- All children shall be screened once a year for identifying "at risk" cases.
- State will take all measures to arrest occurrence of disabilities.
- Staff of primary health centers shall be trained to assist in this work.
- Measures shall be taken for prenatal, perinatal, and postnatal care of mother and child.
- Awareness campaigns shall be organized for the public.

2. **Education**
- Every child with disability shall have the right to free education till the age of 18 years with free books, uniform, and scholarships, appropriate transportation and barrier-free environment.
- Teacher's training institutions shall be established to develop requisite manpower
- Non-formal education

3. **Employment**
- 3% vacancies in Government shall be reserved for blindness/low vision, hearing impairment, locomotor disability and cerebral palsy.
- Government educational institutions including those receiving grant from the government shall reserve at least 3% of seats
- No employee can be terminated from service/ demoted if s(he) becomes disabled during service.

4. **Nondiscrimination**
- All the places of public utilities public buildings, rail compartments, buses, ship and aircraft shall be made barrier-free to give easy access.

5. **Research and development**
- Age relaxation and health and safety measures in workplace environment
- Poverty alleviation schemes
- Reservation at 3%

6. **Affirmative Action**
- Aids and appliances shall be made available
- Allotment of land shall be made at concessional rates for housing, business, special schools, etc.

7. **Social Security**
- Financial assistance to NGOs,

- Insurance coverage to employees with disability
- Preferential allotment of land at concessional rates

8. Grievances Redressal

- Any violation of rights of people with disability may move to the Chief Commissioner for Person with Disability in Center and Commissioner in State.

9. Mass Awareness through TV/radio and other media

- Encourage people on general health, hygiene and sanitation
- For prenatal perinatal and post natal care
- Causes and methods of prevention of disabilities

Penalty

Those who avail or attempt to avail benefits meant for the disabled in a fraudulent manner are 'punishable with imprisonment up to 2 years or a fine up to Rs. 20,000.

COMMENTS

1. Need of change in view about disability: UN Convention on the Rights of Persons with Disabilities (UNCRPD), enforced in May 2008. India is a UNCRPD signatory. UN redefines the old approach of viewing persons with disabilities as "object" of charity, medical treatment and social protection. A person is not disable; it is the environment that males him/her so. their legal capacity must be redefined. They should have full control over decision making and choices. There is a need to move from medico-charity model to human rights and autonomy model.
2. One should not restrict to seven type of disability. Disabilities caused by Heart diseases, cancer, epilepsy, muscular dystrophy, communicable diseases like tuberculosis, hepatitis, HIV infection and AIDS, elephantiasis, fluorosis, disabilities like autism, dyslexia, and hemophilia should be included in the list of disability benefit list.Disability should be recognized as an evolving concept (Mail Today 2009).
3. American Disability Act protects People Living With HIV/AIDS (PLWA) against discrimination in various sectors including employment and health care. However, the Indian Act does not include all categories of disability, e.g. mentally retarded persons are left out from the benefits. Also, the mental retardation has not been clearly defined in the Act.
4. It protects persons with disabilities against discrimination only in the public sector. The Act is ambiguous about the role of private sector and as a result, it does not follow the provisions under this Act.
5. Facilities accorded to disabled under this Act, in term of education and employment are not adequate.
6. Punishment of person who practices discrimination against disabled is ignored.
7. Despite the fact that the physical or mental impairment of people living with HIV/AIDS is not apparent, they are not regarded as able bodied individuals. The stigma associated with their condition is so immense that, they are most often denied access to treatment and discriminated in the workplace, at time resulting in termination of employment and are prevented from participating in mainstream society.
7. Fund allocation and infrastructural development for education, training, and employment of disabled people is inadequate and most of the provisions emphasized in this Act can not be realized. There should be a direction in the Act to allocate budget for achieving the objectives.
8. There is a need to modify design of buildings, transport, sports, and cultural heritage so that disabled persons can have easy accept to such places. Such implementation is not found in majority of places.
9. A comprehensive social security scheme to cover all kinds of disabilities should be adopted rather than a piece meal approach.

THE NATIONAL TRUST FOR WELFARE OF PERSONS WITH AUTISM, CEREBRAL PALSY, MENTAL RETARDATION AND MULTIPLE DISABILITIES ACT 1999

[44 of 1999] AND RULES 2000

This Act provides for the constitution of a body at the national level for the Welfare of persons with Autism, cerebral palsy, mental retardation and multiple disabilities. Section 2 defines "autism as a condition of

uneven skill development primarily affecting the communication and social abilities of a person, marked by repetitive and ritualistic behavior; and cerebral palsy means a group of non-progressive conditions of a person characterized by abnormal motor control posture resulting from brain insult or injuries occurring in the prenatal, perinatal or infant period of development". The trust shall be a body corporate, having perpetual succession and a common seal, with power to acquire, hold and dispose movable and immovable property and to contact and shall, by the said name sue or be sued. The general superintendence, direction and management of the affairs and business of the trust shall vest in a board (Sec 3).
The objects of the trust (Sec 10) shall be:

a) to enable and empower persons with disability to live as independently and as fully as possible within and close to the community to which they belong;

b) to strengthen facilities to provide support to persons with disabilities to live within their own families;

c) to extend support to registered organizations to provide need based services during the period of crisis in the family of persons with disability;

d) to deal with problems of persons with disability who do not have family support;

e) to promote measures for the care and protection of persons with disability in the event of death of their parent or guardian;

f) to evolve procedure for the appointment of guardian and trustees for persons with disability requiring such protection;

g) to facilitate the realization of equal opportunities, protection of rights and full participation of persons with disability.

Any association of persons with disability, or any association of parents of persons with disability or a voluntary organizations engaged in the promotions of, welfare or persons with disability can apply for registration to the board (Sec 12).
Any parent of a disable or his relative can apply to the local level committee for the appointment of any person of his choice to act as a guardian of the persons with disability. But the local level committee is empowered to consider whether the person needs a guardian (Sec 13,14).

DISABILITY OF MENTAL FUNCTION

Under Section 84 of the Indian Penal Code, a person is not liable to be prosecuted if they are of unsound mind (idiots, the very ill, lunatics and drunks), or incapable of comprehending the nature of the criminal act and the fact that it is against the law.

An idiot is one who is of non-sane memory from his birth, by a perpetual infirmity, without lucid intervals: and those are said to be idiots who cannot count 20, or tell the days of the week or who do not know their fathers or mothers or the like (Supreme Court of India 2008).

Dhananjay Mahapatra. Supreme Court defines who's an idiot. TNN 31 Aug 2008, 0128 hrs IST.

In Sri Lanka, 600,000 people or 3% of the population suffer from some kind of mental disorder. More than three decades of conflict and effects of tsunami are having a huge impact on the mental well-being of the Sri Lankan population, on its most deprivedsector in particular, a WHO report said.

MENTAL HEALTH ACT, 1987

(For care and rehabilitation of mentally Ill person)

The Mental Health Act 1987 repeals Indian Lunacy Act 1912 and Lunacy Act, 1977 (Jammu & Kashmir) and extends to whole of India. Under this Act 1987, a "Mentally Ill person" means a person who is in need of treatment by reason of any mental disorder other than mental retardation (Subsec. (1) of Sec. 2).
Psychiatric hospitals and nursing homes can be established or run only on obtaining a license from state or central authority for mental health services, and would be regulated for proper functioning and care of the mentally ill. Psychiatric services provided from a general hospital or nursing home would not be covered by the licensing and regulating rules (Secs. 3-10).

Any person aged eighteen and above can voluntarily get admission for inpatient treatment. In case of minor (less than 18 years of age) mentally ill, can be presented for admission by the guardian as a voluntary patient. The medical officer in-charge, should be satisfied about

the need of inpatient treatment (Secs. 15, 16,17).
Patients admitted on voluntary basis, if they request for discharge, are obliged to be discharged by the medical officer in charge within 24 hours of receiving the request, provided the medical officer is convinced that the discharge will not harm the interest of the voluntary patient. In such case, the medical officer would constitute a Board of two medical officers and seek their opinion. If the Board is of the opinion that such voluntary patient needs further treatment in the psychiatric hospital or psychiatric nursing home, the medical officer shall not discharge the voluntary patient but continue his treatment for a period not exceeding 90 days at a time (Subsec. 3 of Sec. 18).
Admission to psychiatric hospital *under special circumstances* can also be made on request of a relative or a friend of the patient, if the patient is not in a position to express willingness for admission as a voluntary patient, provided the medical officer in charge is satisfied that it is in the interest of the patient to do so. This application should be accompanied by two medical certificates (one from a medical officer who is working in governmental service) stating that the person has such mental illness and it requires inpatient observation and treatment (Subsecs. 1&2 Sec. 19).

No person admitted on the request of another person can be kept in the mental hospital for more than 90 days unless admitted under a ***Reception Order*** (S.S.2/ Sec.19). Apart from voluntary admission, a mentally ill person can be admitted through Reception Order. An application for reception order may be made by the Medical Officer in charge of a mental hospital, by the spouse or by any other relative of the mentally ill patient for admission to the Magistrate. The application should be accompanied by two medical certificates from two independent medical practitioners certifying the need for admission for treatment, and that is in the interest, for personal safety of the patient, or that of others. The medical practitioners should have seen the patient within the last ten days prior to the application. The magistrate can pass the Reception Order or Rejection to the application, after personally reviewing the documents and personally examining the alleged mentally ill (unless for reasons which he considers expedient not to personally examine). The consideration of the application should be made in the presence of applicant, the allegedly mentally ill person, and the person appointed by the allegedly mentally ill to represent him (Sec. 22). A Reception order is valid up to 30 days only or till discharged (Sec. 31).

A mentally ill patient admitted by relative or friend can also apply to the magistrate for discharge (Subsec. 3 of Sec. 19). Detailed procedures are laid down for being taken into custody by the police, confinement and security of mentally ill persons or prisoners in a mental hospital (Sec. 23,35).

Detailed procedure are laid down for ensuring proper care and custody to a mentally ill person by his legal relatives, through the police stations (Sec. 25).
The Act provides for regular, thorough supervision of mental hospitals and nursing homes by monthly joint inspection of three visitors designated by the Central or State authority for health services (Sec. 37).

Any person (other than a prisoner) admitted to a psychiatric hospital who feels he has recovered from his mental illness can apply for discharge to the magistrate, supported by a medical certificate from the medical officer incharge of the hospital (Sec. 43); he can be allowed to take leave from the hospital on request of his relatives or friends for a specified period (Sec. 45).

Detailed procedure of safety in hospital, or during leave or absence or transfer to another hospital has been laid down in Secs. 45, 46, 47. Similarly safe custody and protection of property of the patients has been defined in Secs. 50-77. Physical or mental cruelty to mentally ill patients is forbidden. Similarly conduct of research on a mental patient is forbidden, unless voluntarily consent from patient or relatives is obtained. The human rights of a mentally ill person are protected under Sec. 81. Penalties and fines for contravening the provisions of the Act have been discussed (Secs. 82-87).

COMMENTS

1. The Mental Health Act is one of the good legislations. It came into force in 1993 however it is enacted in 1987 which shows that the Act was given low priority.
2. Mental Health Authorities are formed as watchdog bodies to ensure the quality of services. Govt. and private psychiatric hospitals need to get license

from these authorities. Practicing psychiatrists have raised objection for this because other branches of medicine do not have similar regulatory bodies to assess the quality of care.

MHA excludes the Government Hospital Psychiatry Units (GHPUs) from the defintion of Psychiatric Hospitals/Nursing Homes. Hence, Govt GHPUs (incl. most of the hundred odd government medical colleges GHPUs) donot need a license but since Involuntary Admission under MHA is possible only in a Psychiatric Hospital/ Nursing Home,cannot admit involuntary patients. Private GHPUs including private medical colleges need a license and can admit involuntary patients.

This is one of the reasons causing poor quality control in government hospitals. Quality assurance should be alike for government as well as private GHPUs whether they look after voluntary or involuntary patients. This is also one of the reasons behind corruption in GHPUs which are administered by government system and which ultimately undermines the resources available to the financially weaker section of society.

3. Role of judiciary in admission and discharge of psychiatric patients give an impression of criminal favor (Dutta 1995).
4. One of the flaws is considering mentally ill patients as violent and dangerous to themselves and to others, that mental illness is incurable and the subject loses his/her reasoning and power of judgement and therefore loses his/her fundamental rights under the Constitution. However, mental illness is just like any other illness. In a majority of cases all the symptoms can be brought under control just as in the case of diabetes, hypertension, etc. Patients with mental illness therefore should have the same rights as other patients; for example, the right to get admitted to any hospital of their choice and be treated by a psychiatrist of their choice.
5. There is a need investment in development of infrastructure and provision of basic facilities in mental hospitals which is still largely ignored.
6. The Act excluded mental retardation, dementia etc. which can not be treated. Another reason could be that the mental retardation is handled by Ministry of Social Justice and Empowerment. But very fact is, that these conditions need gentle mental care and excluding may be against human rights of these patient.
7. There is a separate Act for Drug Abuse and a separate Drug de-addiction program which create problem in linkage with the main mental health program.
8. Each disability is separately taken for management and dealt with separate legislation. The Disability Act 1995 is also separate from mental health and rehabilitation efforts could be the responsibility of Ministry of Social Justice and Empowerment where not much eagerness to deal with mental disability is found.
9. Power and duties of police officers in respect to certain mentally ill persons have been laid dawn in Chapter 4 part B (Sect 23), of the Act. But we can see many mentally ill patients wandering in public places in conditions of total neglect and apathy. This indeed is testimony to the fact that the way section 23 is at present put to use has failed to achieve the objectives of the Act.
10. "Voluntary admission" not always real voluntary rather misused. This needs to be more specific and must have expert opinion on the subject.
11. Private sector hospitals cater the bulk of the mentally ill and providing hospitalization. As in all branches of medicine, in the field of psychiatry also the private sector has more hospital beds than government; the government psychiatric beds nationwide number 20,000 while in the private sector there are around two lac psychiatric beds. Due to the strict criteria for issuing license majority private hospitals do not get it and unable to provide legal facilities.
12. Lack of trained manpower could be due to the strict guidelines of Mental Health Act because there are just about 3,300 psychiatrists and around 700 psychologists and many emigrate to developed nations. This is again due to non-availability of jobs and inability to open their private clinics or nursing home due to stringent laws and stigma associated with psychiatrists and patients.

NATIONAL RURAL EMPLOYMENT GUARANTEE ACT, 2005

This Act was passed by the parliament to provide one hundred days of guaranteed wage employment in every year to every household whose adult members volunteer to do unskilled manual work. A household that wants work under this Act should submit names, age, sex, and addresses of its adult members to the local Gram Panchyat for registration. For work of at least continuous 14 days they should submit an application. Upon registration, a job card will be issued by the gram panchayat with the photographs of adult members of the registered household, it will be valid for five years and will have the registration number of the household. A job card is a document that gives an applicant an entitlement for employment.

Women will get priority to the extent that one-third of persons who are given employment are women who have asked for work. In practice male members get the employment.

Within 15 days from submitting the application or from the date when employment is sought, employment should be provided by the gram panchayat. Gram panchayat will inform applicants when and where to report for work within 15 days, by means of a letter. Public notice of this will be displayed on the Gram Panchayat's office. No contractor will be allowed to work under the scheme.

If the eligible applicant does not get employment within 15 days of demand of work or the date from which he sought work, she/ he shall be provided unemployment allowance. The Act provides in Section 7 (2) for an unemployment allowance at a rate that shall not be less than "one-fourth of the wage rate for the first thirty days during the financial year and not less than one-half of the wage rate for the remaining period of the financial year." It is too less. The Act does not even intend to punish delays in payment of unemployment allowance or pay a penalty for the delays.

At work site safe drinking water, shades for children, period of rest and first-aid box shall be provided at every work site by the implementing agency.

If a worker gets injured working on the site, free medical treatment will be given by the State government. The gram sabha will identify works to be taken up. The Panchayats have the principal responsibility for planning, implementating and monitoring.

All agencies implementing NGEGA will be accountable to the public for their work. Social audit and right to information will apply to each aspect of implementation. This Act will cover whole country within 5 years.

The NREGA 2005 restricts the work opportunity to just one person in the household. The deprivation of full employment to the rural household in this programme, therefore, acts as a discrimination against the needs and rights of women. Employment should be provided to all adult members whosoever wish to work.

The provision for a crèche can be made in the Act that provides childcare and nutrition services to children for the duration of the mothers' working day (8 to 9 hours, six days in a week). Services can and should also be especially targeted for children 0-3 years of age as this group hardly benefits from the centrally sponsored ICDS program in any worthwhile manner. The definition of a crèche should be amplified and made an entitlement in the NREGA.

An average household needs to be supplied 720 kg of cereals per annum to ensure its cereals security (60 kg x 12). The bulk of it must come from the cereal wage component of the Act wage. At 200 days of employment the cereals that can be accessed will be 500 kg (200 x 2.5 kg). In such a scenario the TPDS should provide the balance. Food is not just rice and wheat but many more food items which are essential, at least, pulses, edible oil and iodised salt need to be added to this basket, with emphasis on the supply of nutritious cereals like jowar, ragi, bajra and other "minor" millets.

Achievement

A total of 5365.4 lakh mandays of work generated by the end of 2006. This has been implemented in 200 districts in 27 states where 1.47 crore households get employments. The government has spent 503395.6 lakh rupee (TOI Feb 2007).

COMMENTS

1. The National Food for Work Program was launched in November 2004 in the country's poorest 150 districts. It was supposed to be an interim arrangement, to be phased out once the National Rural Employment Guarantee Act comes into force in the same districts. This program was an experiment, which if successfully carried out, would provide the government the necessary confidence to take responsibility for the Act. However, on the basis of evaluation report an editorial was published in the Time of India stating many gray areas of concern. The main bottleneck is the presence of corruption in the system (Jean Dreze 2005).
2. Worker has to apply in written and continuously watch on notice board of Panchayat. In presence of illiteracy and unfavorable caste system, needy workers would remain jobless or would work for meagre amount of food.
3. This has been observed that BPL cards are also issued to well off people of the village by the *Surpunch* and working conditions of people BPL and scheduled castes have not improved in remote areas of the country and there is not mechanism designed which can be used to improve the conditions.

THE SCHEDULED CASTES AND THE SCHEDULED TRIBES (PREVENTION OF ATROCITIES) ACT, 1989, amended 2015

Incidences of physical and mental torture of Scheduled Castes (SCs) & Scheduled Tribes (STs) are common in Indian society that lead to high morbidity and mortality. This Act is enacted to prevent the commission of offenses of atrocities against the members of the Scheduled Caste and the Scheduled Tribes, to provide for Special Courts for the trial of such offences and for the relief and rehabilitation of the victims for matters connected therewith or incidental thereto. It extends to the whole of India except the state of Jammu & Kashmir. Section 3 defines the following offenses of atrocities which are liable to punishment:

1. Force a member of SC or ST to drink or eat inedible or obnoxious substances;
2. Act with intend to cause injury, insult or annoyance to any member of a SC or ST by dumping excreta, waste matter, carcasses or any other obnoxious substance in his premises or neighborhood;
3. Forcibly remove clothes from the member of a SC &ST or parades him or her naked or with painted face or body or commits any similar act which is derogatory to human dignity;
4. Wrongfully occupy or cultivate any land owned by, or allocated to, or notified by any competent authority to be allotted to, a member of SC or ST or gets the land allotted to him transferred;
5. Wrongfully dispossess a member of SC or ST from his land or premises or interfere with the enjoyment of his rights over any land, premises or water;
6. Compel or entice a member of SC or ST to do "beggary" or other similar form of forced or bonded labor other than any compulsory service for public purposes imposed by the government;
7. Force or intimidate a member of SC or ST not to vote or to vote to a particular candidate or to vote in a manner other than the provided by law;
8. Institute false, malicious suit or criminal or other legal proceedings against a member of SC or ST;
9. Give any false information to any public servant and thereby causes such public servant to use his lawful power to the injury or annoyance of a member of SC or ST;
10. Intentionally insult or intimidate with intend to humiliate a member of SC or ST in any place within public view;
11. Assault or use force on any woman belonging to a SC or ST with the intend to dishonor or outrage her modesty;
12. Being in a position to dominate the will of a woman belonging to SC or ST and uses that position to exploit her sexually to which she would not have otherwise agreed;
13. Corrupt or foul the water of any spring, reservoir or any other source ordinarily used by members of the SC or ST so as to render it unfit for the purpose for which it is ordinarily used;
14. Deny a member of SC or ST any customary right of passage to a place of public resort or prohibit the use; and
15. Force or cause a member of SC or ST to leave his house, villages or other places of residence.

Anybody who contravenes the provision of this Act shall be punishable with imprisonment for a term which shall not be less than six months but which may extend to five years and with fine. Anybody likely to conduct an offense against any member of SC or ST may be removed from the office (Sec 10). For the purpose of providing for speedy trial, the State Government shall establish an Exclusive Special Court for one or more Districts. It shall be the duty and responsibility of the State to make arrangements for the protection of victims, their dependents, and witnesses against any kind of intimidation or coercion or inducement or violence or threats of violence. For effective implementation of this Ac, the Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Amendment Rules, 2016 was published. In these rules norms of payment have been fixed if FIR filed on various crimes under Indian Penal Code. For example, if someone put any inedible or obnoxious substance in mouth of SC/ST person then on FIR at various stages Rs. 1 lakh need to be given; Crime under Section 354A of the Indian Penal Code (45 of 1860)—Sexual harassment and punishment for sexual harassment, on FIR Rs. 2 lakh need to be given.

Welfare of Scavengers

Between 2002 and 2003, according to the Indian Ministry for Social Justice and Empowerment there were 676,000 scavengers. (Towari 2009) However, these figures may have been underestimated because scavenging is illegal and reporting of scavenging work is usually not done. An estimated 1.2 million scavengers in the country are involved in the sanitation of surroundings (Bezwada Wilson of the Safai Karamchari Association. Scavengers are present in the country. According to Sulabh, four to five million people were working as scavengers in 2005 and were often employed by the local civil bodies to clean excrement in public places. The working conditions of these sanitary workers have remained virtually unchanged for over a century. Apart from the social atrocities that these workers face, they are exposed to certain health problems by virtue of their occupation. These health hazards include exposure to harmful gases such as methane and hydrogen sulÞ de, cardiovascular degeneration, musculoskeletal disorders like osteoarthritic changes and intervertebral disc herniation, infections like hepatitis, leptospirosis and helicobacter, skin problems, respiratory system problems and altered pulmonary function parameters. This can be prevented through engineering, medical and legislative measures. While the engineering measures will help in protecting against exposures, the medical measures will help in early detection of the effects of these exposures. This can be partly achieved by developing an effective occupational health service for this group of workers.

Also, regular awareness programs should be conducted to impart education regarding safer work procedures and use of personal protective devices. (Tiwari RR. Occupational health hazards in sewage and sanitary workers. Ind J Occupational & Env Health 2009; Jan)

THE EMPLOYMENT OF MANUAL SCAVENGERS AND CONSTRUCTION OF DRY LATRINES (PROHIBITION) ACT, 1993

This Act is applied to the State of Andhra Pradesh, Goa, Karnataka, Maharashtra, Tripura, and West Bengal and to all the Union Territories. Under this Act the latrine means a place set apart for defecation together with the structure comprising such a place, the receptacle therein for collection of human excreta and the fitting and apparatus. Manual scavenger means a person engaged in or employed for manually carrying human excreta. Water-seal latrine is a pour flush latrine, water flush latrine or a sanitary latrine with a minimum water-seal of 20 millimeters diameter in which human excreta is pushed in or flushed by water. No person shall engaged another person or employ him for manually carrying human excreta. No person shall construct or maintain a dry latrine.

State government is empowered to appoint authorities to executive the provision of this Act. These authorities can appoint a District Magistrate or a sub-divisional magistrate. Executive authority and appointed officer must, as far as practical, try to rehabilitate and promote the welfare of the persons who were engaged in or employed for a manual scavengers in any area. State government is empowered to make one or more

schemes for regulating conversion of dry latrine into or construction and maintenance of water-seal latrines, rehabilitation of persons who were engaged in or employed for as manual scavengers in an area. The schemes could be:

a) time bound phased programs for the conversion of dry latrine into water-seal latrine;
b) provision for technical or financial assistance for new or alternate low cost sanitation to local bodies or other agencies;
c) construction and maintenance of community latrines and regulation of their use on pay and use basis;
d) construction and maintenance of shared latrines in slum areas or for the benefit of society and economically backward classes of citizens;
e) registration of manual scavengers and their rehabilitation;
f) specification and standards of water-seal latrines;
g) procedure for conversion of dry latrines into water-seal latrines;
h) licensing for collection of fees in respect of community latrines, or shared latrines.

State government has the power to appoint inspectors for the purpose of this Act. The inspector are entitled to enter, within the local limits of his jurisdiction, at all reasonable times. He has power to examine and test any latrine and conduct an inspection of any building on which he has reason to believe that an offence has been or is being or is about to be committed. He can also inspect to prevent or reduce environmental pollution. Executive authority can direct the owner or occupier of premises to take remedial measures at his own cost for prevention of environmental pollution or prevention of this practice of scavenging. Central government con constitute project committee, monitoring committee and other committees required to achieve the object of this Act.

Any person who fails to observe the provision of the Act or rules may be liable for punishment with imprisonment for a term up to one year or with fine up to two thousand rupees or with both. In case the failure continues, an additional fine up to one hundred rupees can be given for every day during which such failure continues, after the conviction for the first such failure. The offence is cognizable i.e. police officer has power to arrest the offender without warrant.

This law is enancted by few states and other states have not implemented. These states should be persuaded by the central government for implementation. Responsibility is given to district magistrate and sub-divisional magistrate who has several other duties, responsibilities and powers under other Acts. They may not give enough emphasis on this Act. The law has main focus on prohibition and not on rehabilitation because schemes of rehabilitation are not mandatory.

References

Antony JT. A Decade with the Mental Health Act 1987. Ind J Psychiatry 2000; 42(4): 345-355.

Chandra S, Roberts NA. Disabilities Act 1995 and Social Work Intervention. Social Welfare 2004; 41(12):29-32.

Dutta AB. Medicolegal problems of psychiatrists in private practice. Journal of clinical psychiatry 1995; 1(1).

Gazette of India. The Scheduled Caste and the scheduled Tribes (prevention of atrocities) act 1989. (No 33 of 1989).

Govt. of India. Ninth Five Year Plan 1997-2002, vol II, Planning Commission, GOI, New Delhi

Govt. of India. The Persons with Disability (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995 (1 of 1996).

Govt. of India. The National Trust for Welfare of persons with Autism, cerebral palsy, mental retardation and multiple disabilities Act 1999 (44 of 1999)

Govt. of India. The National Trust for Welfare of persons with Autism, cerebral palsy, mental retardation and multiple disabilities Rules 2000.

Jean Dreze. Loot for Work Program (Editorial). TOI 2005, July 2nd.

Lawyers Collective HIV/AIDS Unit. Disability Law and HIV/AIDS. Newsletter 8, Feb 2001. 63/2 Masjid Road, 1st Floor, Jangpura New Delhi New Delhi 110014

Gazette of India. The Mental Health Act 1987, Govt. of India.

Harihar S, Seshadri H. Needed: New Mental Health Act. The Hindu daily Newspaper 2005; January 30th: 11.

Mathew PD. The Law for the prohibition of employment of manual scavengers and for their rehabilitation. Indian Social Institute 1994.

Kohli A.S. (1997), Social Services to Disabled. Anmol Publications, New Delhi

Krishna, V.V., Dutt, B.S.V., Rao, K.H.(Ed) (2001), Disabled Persons. Discovery Publishing House.

Rao, A.P., Usha, M.N., (1995) Helping the Disabled: Indian Perspective. Ashish Publishing House. New Delhi.

Mishra, B, (1997) Integrating the Handicapped. Anmol Publications. New Delhi.

CHAPTER 74

LEGISLATION RELATED TO OCCUPATIONAL HEALTH

There is a heavy burden of occupational diseases and injuries that have impact on productivity, health and safety in India. It is imperative to strengthen occupational health in India through quality occupational health services with more allocation of resources such as infrastructure, technology, and manpower development. The main responsibility lies with employers but this is seldom realized. To make it effective legal provisions are required. India is signatory to many international treatises and ILO's conventions on occupational health. According to WHO, "every citizen in the world has the right to a "healthy and safe work environment and to one the enable socially and environmentally productive lives". National health policy 2002 has also envisaged the periodic screening of the health conditions of the workers, particularly for high- risk health disorders associated with their occupation.

INDIAN CONSTITUTION

- Recognized that health, safety, and well being of the people must be ensured by the state
- Article 24 (prohibition of anyone below the age of 14 years in a factory, mine, or in any hazardous employment),
- Article 39 {(e &f) that state shall direct its policy towards securing : (e) that the health and strength of workers, men and women, and the tender age of children are not abused and that citizens are not forced by economic necessity to enter vocations unsuited to their age or strength},
- Article 42: The state shall make provisions for just and humane conditions of work and for maternity relief).

The Supreme Court of India

- The Supreme Court of India on 27th January 1995 delivered a historic judgment, which demonstrates the concern of the judiciary for workers and occupational health and safety. 'Occupational accidents and diseases remain the most appalling human tragedy of modern industry and one of its most serious forms of economic waste' '... Though wide gaps have been bridged by subordinate legislation, yet more need to be done'.
- For proper implementation of various legislations large numbers of occupational health experts are required. In some legislation only occupational health expert can be hired to ensure health and safety of the workers by establishing occupational health centers. These legislations are as follows:

To Protect Workers and to Provide Social Security: The Minimum Wages Act, 1948; The Dangerous Machine (Regulation) Act, 1983; The Plantation Labor Act, 1951; The Factories Act, 1948; The Mines Act, 1952; The Employees State Insurance (ESI) Act, 1948; The Workmen's Compensation Act, 1923; The Bonded Labor System (Abolition) Act; The Trade Union Act, 1926; The Dock Workers (Safety, Health and Welfare) Act, 1986; The Mines Labor Welfare

Fund Act, 1972; The Bidi Workers Welfare Fund Act, 1972; The Cigar Workers (Conditions of Employment) Act, 1966; The Contract Labor (regulation & Abolition) Act, 1970;

LEGISLATION FOR FEMALE WORKERS

Since ancient times, women have been involved in household work, agriculture and allied activities. They have also been involved in varied tasks such as handicrafts, agriculture, rural and cottage industry, service industry and also perform heavy physical work. Currently, the proportion of economically active women is greater than that at anytime in human history (Phoon 1988, Bhagoliwal 1995). Labor Department of United States (Bureau of Labor Statistics 1988) has revealed that percentage of women rose by 25% during the 40 year period (1947-1987). A majority was employed in nontraditional "female-intensive" jobs (e.g., clerical, secretarial nursing, teaching, etc.). These jobs are also associated with health hazard (Stellman 1987, Vallinmaki 1997) but they earn only 65% of the male counterpart's earnings in America (Women's Bureau 1988). Lack of organization and assertion of women's right at workplaces make them vulnerable to physical, mental and sexual exploitation. Irrespective of their working status and a contribution in the family income, women all over the world, have to play the traditional role of caretaker of children and elderly, in general, that of a home maker. The united States Public Health Service has estimated that women work for an average of 80 hours/week as compare to 50 hours/ week for men but they earn only 65% of the male counterpart's earning (USPHS 1988).

Protective Legal measures for female workers in India

The justification for protective legislation for women workers has been recognized by all the member countries of the ILO (Bhagoliwal 1995). Following are the legislations (Kartikeyan & Gurav 2002) related to protection of rights of female workers in India:

Mica mines Labor Welfare Fund Act 1946: It is compulsory to appoint a woman member in the advisory Committee.

The Factories Act, 1948: Prohibitions of employment of women in hazardous occupations. Maternity leave for 12 weeks. Separate toilets and washing facilities for male and female workers. Provision of crèches where fifty or more women are employed.

ESI (General) Regulation, 1950: Claims for maternity benefit becomes due on the date of issue of the medical certificate for miscarriage, confinement, premature delivery or pregnancy related illnesses.

The Plantation Labor Act, 1951: Working mothers are to be given time off, during duty hours, for breastfeeding children. Provision of crèches where fifty or more women are employed.

The Mines Act, 1952: Prohibition of employment of women in underground mines which is more risk to health.

Maternity Benefit Act, 1961: Eligible for maternity benefits after completion of 80 days of service. Maternity benefit to be allowed on submission of medical certificate. Cash benefit to be paid by employer in organizations where perinatal and postnatal care is not provided free of charge. The pregnant employee should not be given any work that could adversely affect her health or that of the fetus.

The Bidi and Cigar Workers (Conditions of employment) Act, 1966: Provision of crèches where fifty or more women are employed.

The contract Labor (Regulation and Abortion) Act 1970: Provision of crèches where 20 ore more women are employed. Female employee (except midwives and nurses) should not be required to work beyond nine hours between 7 PM and 6 AM. However, this has been recently amended by Supreme Court in 2005 and women can also work in night shift if security is ensured. Separate toilets and washing facilities for male and female workers are provided.

Limestone and Dolomite mines Labor Welfare Fund Act, 1972: It is compulsory to appoint a woman member in the advisory committee.

Equal Remuneration Act, 1976: Payment of equal remuneration to male and female workers for the same or similar nature work.

Bidi Workers Welfare Fund Act, 1976: It is compulsory to appoint a woman member in the advisory board.

Iron, Manganese, Chrome ore mines Labor Welfare Fund Act, 1976: It is compulsory to appoint a woman member in the Advisory Committee.

The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Services) Act 1979: Separate toilets and washing facilities for male and female workers. Payment of equal remuneration to male and female workers for the same or similar nature of work.

THE FACTORIES ACT, 1948
(Amended on 1987)

The Factories Act is the principal legislation, which governs the health, safety, and welfare of workers in factories. The Act extends to the whole of India. Mines and Railways workers are not included as they are covered by separate Acts. The new Act addresses the issues of safety, health, and welfare. Many amendments were aimed to keep the Act in tune with the developments in the field of health and safety. However, it was not until 1987 that the elements of occupational health and safety, and prevention and protection of workers employed in hazardous process, got truly incorporated in the Act. In the same year rights of the workers are also included.

A **factory** under the Act is defined as any premises/ precincts, where 10 or more persons are employed irrespective of whether power is used in the manufacturing process or not. Further, all persons including those drawing wages above the wage limit can now be taken into account for the purpose of counting 10 persons for coverage of a factory. However, under section 85, the state governments are empowered to extend the provisions of the Act to factories employing fewer workers also. This section has been used to extend the coverage of the Act to workplaces like power looms, rice mills, flour mills, oil mills, saw mills, pesticide formulating units and other chemical units where hazards to health are considered to put workers at risk. Electronic Data Processing Unit or a Computer Unit is installed in any premises or part thereof, shall not be construed to make it a factory if no manufacturing process is being carried on in such premises.

"Occupier" of a factory means the person who has ultimate control over the affair of the factory. The Act does not permit the employment of women and young in a dangerous process or operation. Children are defined, "who have not attained an age of 15 years", are not permitted to be hired (Sec 2, 67) and need to have medical fitness certificates if age is not confirmed (Sec 69).

Section 11 to 20 deal with provision of environmental sanitation that protect the worker from hazardous environment. **Cleanliness** of the working place, privy, benches, stairs, wall etc. are explained (Sec. 11). **Disposal of wastes and effluents** should be without any risk (sec.12). **Ventilation, temperature** inside factory, **dust** and **fumes** emission, **lighting**, artificial **humidification, overcrowding** (minimum of 50 cubic meters per person) are specified (Secs. 13-17). There should be a provision for safe and cool **drinking water** and provision of water in the latrine and urinal. One latrine for 25 female workers but one for 25 male workers up to 100 and one for 50 thereafter. One urinal for 50 person up to 500 men and after that one for every 100 more.

Safety measures like fencing of machines, protection of eyes by use of goggles, precautions against fire, dangerous fumes, etc. are defined (Secs 21-40). Facilities for washing, and resting, canteens, creche (one for more than 30 women) and first aid appliances are provided (Secs. 42-48). One Welfare Officer for 500 or more workers is suggested (Sec. 49).

There is provision for one weekly holiday, and not more than 48 hours in a week an adult worker should work. There is at least half an hour rest after a stretch of 5 hours of continuous work. No women should be employed between 7 PM and 6 AM (Secs. 51-66). No person less than 14 years of age should work in the factory. No child (more than 14 and less than 18 years) should work more than 4 hours a day and should not work in the night between 10 PM and 6 AM. One full wage leave should be given to an adult worker for every 20 days of work and one for every 15 days to the child worker. 12 weeks of maternity leave should be given to a woman.

If an accident occurs in any factory causing death or bodily injury or prevents a worker from working for more than 48 hours, the manager must immediately send notice to the prescribed authority (i.e. Labour commissioner).

Rights of the workers are inserted in Section 111 beside the obligation of workers. Every worker shall have the right to (1) obtain from the occupier, information relating to workers' health and safety at work; (2) get trained within the factory wherever possible, or, to get himself sponsored by the occupier for getting trained at a training center or institute, duly approved by the Chief Inspector, where training is imparted for workers' health and safety at work; (3) represent to

the inspector directly or through his representative in the matter of inadequate provision for protection of his health or safety in the factory.

Following are the ***Notifiable Diseases*** that should be notified to the labor department by factory medical officer:

1. Lead poisoning or its sequelae
2. Lead tetra-ethyl poisoning or its sequelae
3. Phosphorus poisoning or its sequelae
4. Mercury poisoning or its sequelae
5. Manganese poisoning or its sequelae
6. Arsenic poisoning or its sequelae
7. Poisoning by nitrous fumes
8. Carbon bisulphite poisoning
9. Benzene and its derivatives poisoning or its sequelae
10. Chrome ulceration or its sequelae
11. Anthrax
12. Silicosis
13. Poisoning by halogens or its derivatives of hydrocarbons
14. Pathological manifestation due to radium, radioactive substances or X-rays
15. Primary epitheliomatous cancer of the skin
16. Toxic anemia
17. Toxic jaundice due to poisonous substances
18. Oil acne or dermatitis due to mineral oil or its derivatives in any form
19. Byssinosis
20. Asbestosis
21. Occupational or contact dermatitis caused by direct contact with chemical or paints. It could be primary irritants or allergic sensitizers.
22. Noise induced hearing loss
23. Beryllium poisoning
24. Carbon monoxide
25. Coal miner's pneumoconiosis
26. Phosgene poisoning
27. Occupational cancers
28. Isocyanates poisoning
29. Toxic nephritis

COMMENTS

The Act does not have a provision for some important places of work like hospitals, fire stations, and others where serious health and safety risks may exist. Definition of child and which child can work is controversial.

The process of automation and the industrial revolution heralded by microelectronics which has resulted in computer based production methods, increasing use of robots, lasers, and new welding technologies have totally transformed the workplace. Consequently, the role of labour inspection has also changed and needs reorientation. Inspectors need additional skills and expertise and a new approach when assessing and evaluating workplace hazards, however, this is not practiced in India. The increasing complexity of workplace and transfer of technologies due to a burst in economic activities requires that inspectors should possess reasonable amount of knowledge of occupational safety and health with the change in the scenario. Many new chemicals and processes which could be hazardous like garment manufacturing, and coloring and various ergonomic problems, should be enlisted and included in notifiable diseases.

It is more logical to notify the hazards exposure rather than diseases. From same exposure one can have many diseases or health effects. There is a difficulty of making diagnosis of occupational diseases because of non-availability of occupational health & safety professionals and laboratories in the country.

THE MINES ACT, 1952

The Mines Act was first enacted in 1901. Mining, from antiquity has been regarded as a hazardous activity. Much of the problems in mining work are due to dust, which invariably contains silica. The difficulty in dust suppression and the inhalation of the same lead to development of Silicosis, and other pneumoconiosis. Silica is classified as a toxic dust and the resulting pneumoconiosis predisposes to the development of tuberculosis.

The Mines Act, 1952, is the Act for the regulation of labour and safety in mines. The Act now prescribes that the owner, the management, and the workers to maintain watchfulness for identifying hazardous and unsafe conditions of work. The Act assigns important role and responsibility to safety specialists, members of engineering, health, planning, welfare and other personnel to direct their attention for reducing and preventing work related injuries and illness in the mining work.

The Director General of Mines Safety (DGMS) has the authority to exercise powers over 592 coal mines, 29 on shore oil projects, and 6000 metalliferous mines which altogether employ about 1 million workers. The Director General gets assistance from technical officers in electrical, mechanical engineering, as well as statistics, laws and industrial hygiene section

DGMS has a commitment to inspection, and the staff conducts investigation into accidents, and dangerous occurrences. DGMS also monitors the regulatory concerns, and makes bylaws and issues statuary orders through Gazette notification. It also grants statutory permissions, exemptions and relaxation.

THE EMPLOYEES STATES INSURANCE ACT, 1948 & REGULATIONS 1950 (2001)

The Employees' State Insurance Act is to provide for certain benefits to employees in case of sickness, maternity and employment injury and to make provision for certain other matters in relation thereto. It is a social security scheme extends to the whole of India. It shall apply, in the first instance, to all factories (including factories belonging to the government) other than seasonal factories. This defines (sec 2) following terms: 'Employment injury' means a personal injury to an employee caused by accident or an occupational disease arising out of and in the course of his employment, being an insurable employment, whether the accident occurs or the occupational disease is contracted within or outside the territorial limits of India;

'Employee' means any person employed for wages in or in connection with the work of a factory or establishment in department or to which this Act applies with the purchase of raw materials for, or the distribution or sale of the products of, the factory or establishment or any person engaged as an apprentice, not being an apprentice engaged under the Apprentices Act, 1961 but does not include -the Indian naval, military or air forces; or whose wages exceed Rs. 15000 per month or as prescribed by the Central Government.

'Factory' means any premises where 10 or more persons in case of using power and 20 or more in case of not using power are employed or were employed for wages on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on but does not include a mine or a railway.

'Permanent partial disablement' means such disablement of a permanent nature, as reduces the earning capacity of an employee in every employment which he was capable of undertaking at the time of the accident resulting in the disablement.

'Permanent total disablement' means such disablement of a permanent nature as incapacitates an employee for all work which he was capable of performing at the time of the accident resulting in such disablement. 'Seasonal factory' means a factory which is exclusively engaged in one or more of the following manufacturing processes, namely, cotton ginning, cotton or jute pressing, decortication of groundnuts, the manufacture of coffee, indigo, lac, rubber, sugar (including gur) or tea or any manufacturing process which is incidental to or connected with any of the aforesaid processes and includes a factory which is engaged for a period not exceeding seven months in a year.

Every factory or establishment to which this Act applies shall be registered (Sec 2A). The Central Government shall establish (Sec 4) a Corporation to be known as the Employees' State Insurance Corporation (Sec 3). The Corporation shall consist of the following members, namely:- (a) a Chairman, Union Minister of Labor (b) a Vice-Chairman, (c) not more than 5 persons to be appointed by the Central Government, (d) one person each representing each of the States, (e) one person to be represented the Union Territories, (f) 10 persons representing employers (g) 10 persons representing employees, (h) 2 persons representing the medical profession, (i) 3 members of Parliament, and (j) the Director-General of the Corporation ex-officio.

The Central Government shall constitute a Medical Benefit Council (Sec 10) consisting of: (a) the Director General, Health Services, ex officio, as Chairman, (b) a Deputy Director General, Health Services, (c) the Medical commissioner of the Corporation, ex officio, and (d) one member each representing each of the State. Members representing employers, employees, and medical profession are also members. The Medical

Benefit Council shall advise the Corporation and the Standing Committee shall have powers and duties of investigation perform such other duties in connection with medical treatment and attendance. Head quarter of the ESI is in Delhi having network of 45 regional, subregional and divisional officers.

All employees in factories shall be insured in the manner provided by this Act. The ESI schemes through its hospitals and clinics have provided curative health care to workers all over India and have recently entered the area of occupational health. The ESI scheme is administered by the ESIC, an autonomous body consist of Minister for Labour, Minister for Health, 5 representatives of Central Government, one representative each from the States and one representative from all union territories, 5 representative of employees and 5 of employers, 2 of medical profession and 3 Members of Parliament, and Director General of Corporation. This body meets twice a year. The ESI Corporation's main function is to frame policies. The Standing Committee is an executive body and the Medical Benefit Council is an advisory body. The Director General is the Chief Executive Officer assisted by 4 principal officers - 1) Medical Commissioner, 2) Financial Advisor and Chief Accounts Officers, 3) Insurance Commissioner, and 4) Actuary.

Actuary, in insurance, a person trained in statistics, accounting, and mathematics who determines policy rates, reserves, and dividends by deciding what assumptions should be made with respect to each of the risk factors involved e.g., frequency of occurence of the penal, the average benefit that will be payable, the rate of investment earnings, if any, expenses, and persistentcy rates), and who endeavors to secure as valid statistics as possible on which to base his assumptions.

The Act provide power to form state level, local and regional level Medical Benefit Councils and Committees for smooth functioning. ESIC is empowered to appoint inspector to inspect factories regarding the benefits given to workers.

Contribution: Government gives 2/3 rd of administrative expenditure. State Governments share 1/8 th of expenditure on medical treatment and attendance (7/8 being born by the ESIC). The Employer's contribution, a sum equal to 4.75% of the wages payable to an employee; and Employee's contribution, a sum of equal to 1.75% of the wages payable to an employee. The employee who is getting daily wage less than Rs. 70.00 shall be exempt from payment of contribution.

Benefits

1. *Medical Benefit*: The Employees' State Insurance Scheme provides full medical care in the form of medical attendance, treatment, drugs and injections, specialist consultation and hospitalization to insured persons and also to members of their families where the facility for Specialist consultation, hospitalization has been extended to the families.For the families, this benefit has been divided into two categories as under:- *Full Medical Care:* consists of hospitalization facilities and includes specialist services, drugs and dressings and diets as required for in-patients. *Extended Medical Care:* consists of consultation with the specialists and supply of special medicines and drugs as may be prescribed by them in addition to the out-patient care. Special laboratory tests and X-Ray examinations also included. Apart from the curative services provided through hospitals and dispensaries, the Corporation also provides the following facilities including family welfare services such as immunization (under National Immunization Program) to the young children of insured persons.
2. *Old age Medical Care:* Full medical care for self and spouse on superannuation subject to having completed 5 years in insurable employment immediately before superannuation or in case of having suffered permanent physical disablement during the course of insurable employment. The rate of contribution for superannuated /disabled insured person is Rs. 120 per annum payable lump sum at the branch office for availing full medical care for self and spouse.

   Continuing medical benefit to insured persons retiring under VRS scheme or taking premature retirement.

3. *Sickness Benefit*: It is raised to 60% of the average daily wages and is payable for 91 days during 2 consecutive benefit periods. Benefit becomes admissible only after an insured

employee has paid contribution for at least 78 days in a contribution period of 6 months.

Extended Sickness Benefits: Insured persons suffering from long term diseases were experiencing great hardship on expiry of 91 days Sickness benefit. Often they, though not fit for duty, pressed for a Final certificate. Hence, a provision for paying Sickness Benefit for an extended period (Extended Sickness Benefit)of upto 2 years in a ESB period of 3 years.

Extending medical benefit to dependant minor brother/sister in case of IPs not having own family and whose parents are also not alive.

At present this list includes 34 diseases which are grouped in 11 groups as per International Classification of diseases:

I **Infectious Diseases:** Tuberculosis, Leprosy, Chronic Empyema, AIDS

II **Neoplasms:** Malignant Diseases

III **Endocrine, Nutritional and Metabolic Disorders:** Diabetes Mellitus-with proliferative retinopathy/diabetic foot/nephropathy.

IV **Disorders of Nervous System:** Monoplegia, Hemiplegia, Paraplegia, Hemiparesis, Intracranial Space Occupying Lesion, Spinal Cord Compression, Parkinson's disease, Myasthenia Gravis/Neuromuscular Dystrophies,

V **Disease of Eye:** Immature Cataract with vision 6/60 or less, Detachment of Retina, Glaucoma

VI **Diseases of Cardiovascular System:** Coronary Artery Disease:- Unstable Angina, Myocardial infraction with ejection less than 45%, Congestive Heart Failure- Left , Right,Cardiac Valvular Diseases with failure/ complications, Cardiomyopathies, Heart disease with surgical intervention alongwith complications.

VII **Chest Diseases:** Bronchiectasis, Interstitial Lung Disease, Chronic Obstructive Lung Diseases (COPD) with congestive heart failure (Cor Pulmonale),

VIII **Diseases of the Digestive System:** Cirrhosis of liver with ascities/chronic active hepatitis.

IX **Orthopaedic Diseases:** Dislocation of vertebra/prolapse of intervertebral disc, Non union or delayed union of fracture, Post Traumatic Surgical amputation of lower extremity, Compound fracture with chronic osteomyelitis.

X **Psychoses:** Sub-group under this head are listed for clarification, Schizophrenia, Endogenous depression,Manic Depressive Psychosis (MDP), Dementia

XI **Others:** More than 20% burns with infection, Complication, Chronic Renal Failure, Reynaud's disease/Burger's disease.

4. *Maternity Benefit*: At the rate of full wages (twice the standard benefit rate) for a period of 12 weeks in case of pregnancy and 6 weeks in case of miscarriage or MTP. Medical bonus to an insured woman and an insured person in respect of his wife shall be paid a sum of Rs. 250.00 per case as medical bonus on account of confinement expenses.
5. Confinement Expenses: Employees State Insurance Corporation (ESIC) has doubled the monetary grant paid to pregnant women from Rs 2,500 to Rs 5,000, in case they go for delivery in dispensaries and hospitals not registered by the Corporation.
6. *Disablement Benefit (Cash)*: the daily rate of disablement shall be 40% more than the "standard benefit rate" is given to the temporary disabled person during the period of disablement. In case of permanent disablement, the payment is made at the same rate for the whole of his life in the form of pension. The rate of Disablement Benefit has been enhanced from about 70% to about 75% of average daily wage w.e.f. 01.12.2007.
7. *Dependent Benefit (Cash)*: Widow or legitimate or adopted child (up to the age of 25 year or till the daughter get married or widow remarried) or widowed mother or dependent parents (under certain conditions) of the diseased person gets the daily rate of dependent's benefit that is 40% more than "standard benefit rate". The rate of Dependants' Benefit has been enhanced from about 70% to about 75% of average daily wage w.e.f. 01.12.2007.
8. *Vocational rehabilitation* of disabled insured persons under the age of 45 years with 40% or more disablement.

9. *Physical Rehabilitation:* Special Aids are provided. Insured persons and members of their families are provided artificial limbs, hearing aids, and artificial appliances like spinal supports, cervical collars, walking calipers, crutches, wheel chairs and cardiac pace makers as a part of medical care under the Scheme.
10. *Unemployment Allowance (Rajiv Gandhi Shramik Kalyan Yojana):* unemplyment allowance is payable to those workers facing involuntary unemployment due to closure of factory/establishment; retrenchment or permanent invalidity arising out of non-employment injury. The daily rate of unemployment allowance is at par with the standard sickness benefit rate, which is just above 50% of the daily wages which is payable for maximum of 12 months.
11. *Funeral Benefit*: It was introduced in 1966 and currently an amount of Rs. 10,000 is paid to the eldest surviving member for the funeral purpose.

Treating commuting accidents as employment injury.

Other Benefits

Family Wefare Services: The Corporation has organized these services in 180 centres besides reserving 330 beds in hospitals for undertaking Family Planning operations and provides other benefits to the families of insured.

The ESIC at a glance

Particulars	As on 24th Feb 2013
State/UT covered	29
No. Centers	783
No. of employees	1.25 cr
No. Insured person/family units	1.71 cr
No. Insured women	22.64 lakh
Total Beneficiaries	6.63 cr
No. Employers	3.94 cr
ESI hospitals	150
beds	23923
ESI Annexes	42
beds	849
beds reserved in other hospitals	27739
ESI dispensaries/Ind Sys Med Units	1372/91
Insurance Medical Officers	7340
Insurance Medical Practitioners	1678

New Initiatives

1. Setting up of medical, nursing, dental colleges and paramedical schools iin ESI hospitals
2. ESI scheme extended to medical and educational institutions in most of the states in India.
3. Disabled persons, working in factories and establsihments covered under the ESI Act drawing wages up to Rs. 25000/ month are covered under the ESI scheme and Emplyers share of contribution is paid by the Central government for three years.
4. In order to provide hassle free services to the stake holders, ESIC is implementing an IT Roll Out Plan named "Project Panchdeep". The project Panchdeep includes the work relating to issue of two identity cards to the insured persons (one for IP and one for his family) for availing of cash and medical benefit from an institution of ESIC, anywhere in the country.
5. Treatment under AYUSH also available in ESI hospital/dispensaries.
6. All major treatment such as Kidney and liver transplant, heart treatment, cochlear implants and joint replacements are now covered under ESI Scheme.
7. All casual and contract workers including those working in establishments like shops, hotels, restraurants, transport undertakings, theaters, Newspaper establishments, insurance business, Non-banking financial companies, ports trusts, etc. are now covered under the ESI scheme.

The State Government shall constitute an Employees' Insurance Court for the local area. The court shall decide any question or dispute arises in rates or payment of contribution, rates of wages or daily wages, violation of the right of any person to any benefit and as to the amount and duration. In contravention of any of the articles of Act or rules shall be liable for punishment.

For Employers

Benefits

1. Legal flexibility-employers under the ESI scheme are exempt from the following acts permitting them greater flexibility: Maternal Benefits Act and Workmen's Compensation Act.
2. It provide productive workers to the employers which increase their profits.
3. Reduce liability/responsibility of paying cash

benefits in case of injuries, sickness and death of insured person.

4. Tax reliefs: any sum paid by way of contribution under the ESI act is free from any tax liability under the Income Tax Act.

Employer should fulfill their obligations

1. Paying of employers' share @4.75 percent of the wages and employees' share @ 1.75 percent of the wages.
2. Maintain an 'Accident book' and all accident which result in disablement or death should be reported within 24 hours.

Risk categories

An estimated figure of employees, exposed to occupational diseases in some specific industries, presently covered under the ESI Act 1948 is given below:

1. Cotton & Textile	15,00,000
2. Leather & Rubber	03,00,000
3. Chemical & its product etc.	05,20,000
4. Non-Metallic Minerals	02,60,000
5. Metallic Minerals	05,20,000
6. Transport	02,80,000
7. Paper & Printing	02,77,000

Personal Protective Equipments

The use of Personal Protective Equipments (PPEs) interpose an effective barrier between a worker and any harmful substance or object, but do not eliminate any occupational hazard totally. PPEs are not a substitute for basic needs like risk protective engineering inputs or adequate environmental control within the premises besides physically tolerable working hours and good calories diet. Some PPEs for enhancing personal safety of workers are recommended (Table 74.1).

Table 74.1: Personal Protective Equipment recommended

Body Part Protection	Equipment recommended	Protection from
Head	head caps, helmet	falling objects, flying particle, sparks, hot mate
Eyes	safety spectables	dust, flying object splashing liquid, chemicals, gases, fumes, glares, etc
Ears	Ear plugs, ear muff	noise
Face	Face shields	Splash, flying particle, gas,fumes
Arms & Hand	Gloves, sleeves hand pads, finger	Hot & Molten metals, chemical, corrosive sparks acids, alkalies, electric shock,
Feet & Legs	Safe shoes, gum boots, foot guard	Flying objects acids, alkalies, heat sparks, electric shock
Body	Aprons, overall jackets, protective suits, coats	Hot material, heat sparks, acid, alkali flying objects,
Respiratory	Respirator & Mask	Dust, fumes, smokes, gases
Miscellaneous	Barrier cream, safety belts	Dermatitis due to chemicals, slip or fall while walking

Occupational Disease Centers

The corporation has decided to establish four Zonal Occupational Disease Center at New Delhi, Mumbai (Pune), Kolkata and Chennai as referral institutions for early detection and prevention of occupational diseaes with the help of advanced clinical and laboratory facilities. The occupational disease center at New Delhi was the first one to be commissioned in Feb 1994, the other three ODCs were pressed into service in May-June 1995.

Complaints

For the complaint regarding ESIC can be registered on toll free number 1800 11 2526; website: esic.nic.in

Penalty

ESIC coverage is mandatory if factory has 10 workers with power use and 20 or more workers without power use. Failure to discharge this resposibility will result in levy of interest of contribution and also imposition of damage under sec 85 B. Default in payment of contribution is an offense, for which one is liable to be punished with imprisonment up to 5 years or and fine of Rs. 25,000/-.

COMMENTS

This Act is one of the pillars of social security in India but do not cover all workplaces and workers. ESI should also focus on occupational health and safety of the workers beside curative aspects.

If possible the duplication of health services should be abolished and more emphasis should be given on quality. Family members of the employee should be encouraged to avail the facilities of ESI only and not of other facilities of government.

THE WORKMEN'S COMPENSATION ACT, 1923

[Amended in 1984, 2000]

Any worker employed in any of a wide variety of hazardous occupations suffers an injury is eligible for compensation. If he dies, his dependents can claim the benefits provided by the Act. The injury must disable him for more than 3 days, totally or partially. The disablement means the loss in the earning capacity of a workman in every employment which he was capable of doing at the time of the accidents. Its effect may be temporary or permanent (Schedule1). To get compensation for an occupational disease, a workman must have been employed in the specified occupation for a continuous period of at least 6 months. If the compensation is not paid within one month after the date due, a simple interest at 6% per annum on the arrears can be recovered from the employer.

The compensation is paid to the workers according to the damage:

1. In case of death: 40% of the monthly wage of the deceased workman, multiplied by the relevant factor, or Rs. 20,000; whichever is more.
2. In case of total permanent disablement: 50% of the monthly wage, multiplied by the relevant factor; or Rs. 24,000; whichever is more.
3. In case of partial permanent disablement: The compensation is a percentage of that payable in the case of total permanent disablement. The earning capacity is determined by a qualified medical practitioners.
4. In case of (total or partial) temporary disablement: A sum equal to 25% of the monthly wages of the workman shall be paid half - monthly.

The minimum rate of compensation is proposed to be raised from 50,000 to Rs. 80,000 for death and from Rs.60,000 to Rs. 90,000 in case of permanent/total disablement.

State Government appoint Commissioners to investigate and solve every case for workmen's compensation. The appointed Commissioner's tribunal has some powers of a civil court. An appeal against any order of the Commissioner can be filed in the High Court. This must be done within 60 days of the order or decision of the Commissioner.

THE MINIMUM WAGES ACT, 1948

This Act was enacted, with the object of doing social justice to workmen, who were employed in certain unorganized employment in order to protect them from exploitation by the Capitalist classes. For this central or state government would appoint a competent authority (any number of committees, or subcommittees) to decide about minimum wages and keep revising every five years according to the change in economic growth and standard of living (Sec 2 b, 5) and publish every year in February and August, if there is a change in market price. This appointed committee would ask suggestions, objections and grievances of all affected persons. The Act provides rules and methods for establishment and composition of Central Advisory Board which will advise central and state government in the matter of fixation wages and working hours (Sec 8). The government should provide a day of rest for every 7 days and such a rest day would also be included as a full working day when computing the payment. Whenever an employee works on a rest day, should be paid at a rate not less than the overtime rate. This provision is not applicable to those

Scheduled I

SNo.	Description of injury	% of loss of earning capacity
	Part I	
	Injuries Deemed to Result in Permanent Total Disablement	
1.	Loss of both hands	100
2.	Loss of a hand and a foot	100
3.	Amputation of one leg/thigh and loss of other foot	100
4.	Loss of sight and unable to work	100
5.	Very severe facial disfigurement	100
6.	Absolute deafness	100
	Part II	
	Injuries Deemed to Result in Permanent Partial Disablement	
1.	Amputation through shoulder joint	90
2.	Amputation below shoulder with stump <8" from tip of acromion	80
3.	Amputation from 8" from tip of acromion to <4-1/2" below tip of olecranon	70
4.	Loss of hand or of thumb and four fingers of one hand	60
5.	Loss of thumb	30
6.	Loss of thumb and its metacarpal bone	40
7.	Loss of four fingers of one hand	50
8.	Loss of three fingers of one hand	30
9.	Loss of two fingers of one hand	20
10.	Loss of terminal phalanx of thumb	20
	Amputation cases-lower limbs	
11.	Amputation of both feet resulting in end-bearing stumps	90
12.	Amputation though both feet proximal to metatarsophalangeal joint	80
13.	Loss of all toes of both feet through the metatarsophalangeal joint	40
14.	Loss of all toes of both feet proximal to the interphalangeal joint	30
15.	Loss of all toes of both feet distal to the proximal interphalangeal joint	20
16.	Amputation at hip	90
17.	Amputation below hip with stump not exceeding 5" from tip of greater trochanter	80
18.	Amputation below hip with stump exceeding 5" but not beyond high	70
19.	Amputation below middle high to 3-1/2" below knee	60
20.	Amputation below knee with stump exceeding 3-1/2" but not 5"	50
21.	Amputation below knee with stump exceeding 5"	40
22.	Amputation of one foot resulting in end-bearing	30
23.	Amputation through one foot proximal to metatarsophalangeal joint	30
24.	Loss of all toes of one foot through the metatarsophalangeal joint	20
	Other injuries	
25.	Loss of one eye, without complication to other	40
26.	Loss of vision of one eye and other is normal	30
	Index Finger of right or left hand	
27.	Whole	14
28.	Two phalanges	11
29.	One phalanx	9
30.	Guillotine amputation of tip without loss of bone	5

	Middle finger	
31.	Whole	12
32.	Two	9
33.	One phalanx	7
34.	Guillotine amputation of tip without loss of bone	4
	Ring or little finger	
35.	Whole	7
36.	Two	6
37.	One phalanx	5
38.	Guillotine amputation of tip without loss of bone	2
	Toes of right or left foot Great Toe	
39.	Through metatarsophalangeal joint	14
40.	Part, without loss of bone	3
41.	Any other toe	3
42.	Part, any other toe without some loss of bone	1
43.	Two toes of one foot through metatarsophalangeal joint	5
44.	Part, two toes without loss of bone	2
45.	Three toes	6
46.	Three toes part only without loss of bone	3
47.	Four toes of one foot, exceeding great toe	9
48.	Part of four toes, without loss of bone	3

employment which deals with any emergency, or technical requirement, like medical, electricity, railways, etc.

For nonpayment of the minimum wages or for contravention of the rules relating to hours of work, i.e. normal working days, employee can approach labour commissioner of the district. Violation of provision by the employer would attract punishment with imprisonment for a maximum term of 6 months or fine to the maximum extent of Rs. 500 or both. In the present context there are certain issues which prohibit this Act to give full benefit to those for whom this Act is made. People are poor and illiterate and ill informed about their rights. The penalty is also very less.

At the all-India level, average wages received by regular wage/salaried employees was Rs. 396 per day. This was Rs. 299 in the rural areas and Rs. 450 in the urban areas. In the rural areas, wages received per day by a regular wage/salaried employee was was Rs. 322 for males and Rs. 202 for females, indicating the female-male wage ratio as 0.63. In the urban areas, this was Rs. 470 for males and Rs. 366 for females, indicating the female-male wage ratio as 0.78 (NSSO 2013).

The Govt. of NCT Delhi, Labour Department's has notified under the Minimum Wage Act, 1948, the following rates of minimum wages applicable to all 29 scheduled employments such as shops, establishments, and factories in Delhi with effect from 1st Oct 2013 (TOI 21st March 2014) (Table 74.2).

Table 74.2: Minimum wages in Delhi

I. Categories	Per Month (in Rs.)	Per Day (in Rs.)
1. Unskilled workers	8086	311
2. Semiskilled workers	8918	343
3. Skilled	9802	377
II. Clerical and Non-Technical Supervisory Staff		
1. Non-Matriculate	8918	343
2. Matriculate & Non-Graduate	9802	377
3. Graduate & Above	10686	411

source. www.labour.delhigovt.nic.in

CONTRACT LABOR (REGULATION AND ABOLITION) ACT, 1970
[Act No. 37 of Year 1970]

Contract Labor Act is to regulate the employment of contract labor in certain establishments and to provide for its abolition in certain circumstances and for matters connected therewith. It extends to the whole of India. It applies-

(a) to every establishment in which 20 or more workmen are employed or were employed on any day of the preceding twelve months as contract labor;
(b) to every contractor who employs or who employed on any day of the preceding twelve months twenty or more workmen.
(c) It shall not apply to establishments in which work only of an intermittent or casual nature is performed but may be considered by the Board or if it was performed for more than one hundred and twenty days in the preceding twelve months, or if it is of a seasonal character and is performed for more than sixty days in a year.

In this Act following terms (Sec 2) are defined:
"workman" shall be deemed to be employed as "contract labor" in or in connection with the work of an establishment when he is hired in or in connection with such work by or through a contractor, with or without the knowledge of the principal employer;

"contractor", in relation to an establishment, means a person who undertakes to produce a given result for the establishment, other than a mere supply of goods or articles of manufacture to such establishment, through contract labor or who supplies contract labor for any work of the establishment and includes a subcontractor;

"establishment" means- (i) any office or department of the government or a local authority, or (ii) any place where any industry, trade, business, manufacture or occupation is carried on;

"principal employer" means- any office or department of the government or a local authority, the head of that office or department or such other officer as the government or the local authority; or in a factory/mine, the owner or occupier of the factory and where a person has been named as the manager of the factory/ mine or any person responsible for the supervision and control of the establishment.

The Central Government shall constitute a Board to be called the Central Advisory Contract Labor Board to advise (Sec 3). Similarly state government shall form the board. The board shall prohibit (Sec 10) employment of contract labor in any process, operation or other work in any establishment without registration. The appropriate government may appoint a person to be licensing officers for the purposes of this Act (sec 11). For the health and welfare of worker, provision of canteens (Sec 16), rest room (Sec 17), drinking water, latrine and urinals and washing facilities (Sec 18), and first aids (Sec 19) from the contractors are made and if he/she is unable to do so then principal employer shall provide and all expenses incurred by the principal employer can be obtained from Contractor (Sec 20). A contractor shall be responsible for payment of wages to each worker employed by him as contract labor (Sec 21) and the principal employer shall make sure that the wages are paid. The minimum wage rates will be applied as notified under the Minimum Wage Act from time to time (Pls see Minimum Wage Act).

Whoever interferes with the inspection shall be punishable with imprisonment for a term, which may extend to three months, or with fine which may extend to five hundred rupees, or with both (Sec 22). Whoever contravenes any provision of this Act or of any rules made shall be punishable with imprisonment for a term which may extend to three months, or with fine which may extend to one thousand rupees, or with both, and in the case of a continuing contravention with an additional fine which may extend to one hundred rupees for every day during which such contravention continues after conviction for the first such contravention.

Comments: Workers are continued to work longer with low wages and suffer various types of diseases. In case of one of our surveys among food handlers in a medical college, we found that 95% had one or other morbid conditions, 41% had worm infestation and 46% had injuries and burns. There were unsatisfactory measures to protect the workers (Malhotra et al 2007).

CONTRACT LABOUR (REGULATION AND ABOLITION) CENTRAL RULES, 1971: CONSTRUCTION AND MAINTENANCE OF CRECHES

In exercise of the powers conferred by clause (vi) (d) of sub-rule (2) of Rule 25 of the Contract Labour (Regulation and Abolition) Central Rules, 1971, the Chief Labour Commissioner (Central) New Delhi hereby specifies the standard of construction and maintenance of the Creches as under:

1. A Creche should be located within 50 meters of every establishment where 20 or more women are ordinarily employed as contract labour. The proximity should be away from obnoxious fumes, dust or odors or excessively noisy processes.
2. The Creche building should be constructed of heat or cold resisting materials and should be rainproof. The height of the rooms should be not less than 10 feet from the floor with adequate light and ventilation by free flow of air. Space should be at least 20 sq. ft of floor area per child. A suitable bathroom and latrine adjoining the Creche for the children should be available. The number of seats in the latrine shall be at the rate of one for every 15 children. Separate latrines should be maintained for the use of mothers and Creche staff at a distance of not less than 50 ft from the Creche. Adequate supply of clean towels and soap should be available at the Creche.
3. The building should be periodically inspected in order to see for safety and sanitation.
4. The Creche will be kept open at all times both by day and night, when women employees are working.
5. Cool and wholesome drinking water should be available for the children and the staff of the Creche. There should be a supply of water at the rate of 5 gallons per child per day. Children below 2 years of age should be fed with at least 1/2 pint of pure milk per child per day. Children above 2 years of age should be given wholesome refreshments.
6. Convenient and suitable arrangements should be made for the working mothers to feed their children below 2 years of age during the intervals.
7. There shall be a kitchen attached to the Creche with utensils and other facilities for boiling milk and preparing refreshments, etc.
8. The children as well as the staff of the Creche should be provided with suitable uniforms to wear at the Creche.
9. The Creche should have the following equipment at the rate of one for each child: (i) Cradles or cots, (ii) Beds or mattresses, (iii) Cotton sheets, (iv) Rubber sheets (for children below 3 years), (v) Blankets, (vi) Pillow with covers.
10. Every Creche should be in the charge of a woman with midwifery qualification or training as Creche attendant and assisted by female ayahs.
11. The Creche should have first-aid equipment kept in proper condition.
12. Every child should be medically examined before admission. There should be medical checkup including weight of the children once a month.
13. Creche should maintain the records and registers.

THE PLANTATION LABOR ACT, 1951

The Act provides for the welfare of labour and regulate the conditions of service in plantations. It extend to whole India, except Jammu and Kashmir. Any worker drawing salary of Rs. 750/ - per month are covered under this Act. The Chief Inspector have to insure that the medical benefits to the worker and their families, drinking water, latrines and urinals are provided. Canteens, Crèches, recreational, educational and housing facilities should be provided by the employers. For every 300 or more workers one welfare worker is required. The Act regulate working hours, leaves and holidays. Sickness and maternity benefits are also provided under this Act.

UNORGANIZED SECTOR WORKERS' SOCIAL SECURITY ACT 2005

To provide for social security and welfare of unorganized sector workers the Parliament of India enacted this legislation which is applicable to whole of India. In the chapter 1 various terms are defined such as:

"Employer" means a company or a person, for whom any unorganized worker is working or association of employers or traders who engage unorganized workers.

"Family" in relation to that of a worker means and includes the spouse, minor legitimate and adopted children, unmarried daughters and dependent parents. 'Unorganized Sector Worker" means a person who works for wages or income; directly
or through any agency or contractor; or who works on his own or her own account or is
self employed; in any place of work including his or her home, field or any public place; and who is not availing of benefits under the ESIC Act and the P.F Act, individual insurance and pension schemes of LIC, private insurance companies, or other benefits as decided by the Authority from time to time.

In chapter II there is provision of constitution of National Social Security Authority for the Unorganized Sector having power to acquire, hold and dispose property, both movable and immovable, and to contract and shall by the said name sue or be sued. The Authority shall consist of a Supervisory Board and an Executive Office. The Authority shall formulate policy and undertake any and all activities to deliver the intent of this Act. Supervisory Board shall consist of at least fifty percent of members who are representatives of workers in the unorganized sector and at least one third women members in addition to professionals with background in areas of expertise such as finance, insurance, and systems-operations and representatives of Central and State Government. Executive Office of the Authority shall have a Managing Director, and two Executive Directors who shall be responsible for framing policies, schemes, and procedures for the functioning of the Authority. The Supervisory Board shall advise the Directors on matters of policy and receive quarterly reports from the Managing Director. The Directors will appoint "Facilitating Agencies" to conduct the activities of the Authority which will in turn set up, administer, and supervise Worker's Facilitation Centres

The following may be appointed as the Facilitating Agencies by the Directors:

1) Self Help Groups or their Associations
2) Post offices
3) All types of Co-operative societies
4) Micro-Finance Institutions
5) Trade Unions
6) District Panchayat
7) Village Panchayat
8) Existing Welfare Boards
9) Urban local body
10) Any other organization or agency dealing directly with unorganized workers as may be prescribed by the Authority.

The Worker Facilitation Centres shall be set up by the Facilitating Agency and shall be operated under its control and supervision. The core functions shall be: 1) Registration of workers and giving them unique identification social security numbers and identity cards. 2) Mobilization of workers. 3) Securing the contribution of members to the funds. 4) Assuring delivery of benefits to the members. 5) Maintaining a database of members. 6) Skill upgradation training. 7) To maintain and provide information related to employment and marketing opportunities workers. 8) To constitute employment exchanges for unorganized sector. 9) To create public awareness about schemes available for workers. 10) To collect statistics and information of workers engaged in the employments of the unorganized sector.

Chapter 3 has described rules for registration of workers and their duties (Sec 13). Chapter 4 has described rules for social security schemes (Secs 15-17). Chapter 5 has described constitution of welfare funds (Sec 19), provision for grants and loans, contribution of workers, and contribution of employers. Chapter 6 has described the powers of framing rules, delegation of power, exemptions, etc.

THE BONDED LABOR SYSTEM (ABOLITION) ACT, 1976

An Act to provide for the abolition of bonded labor system with a view to prevent the economic and physical exploitation of the weaker sections of the people. This Act is extended to whole India. Section 2 define many terms mainly 'advance', 'agreement', 'bonded debt (an advance obtained, or presumed to have been obtained by a bonded laborer)', 'bonded laborer (a laborer who incurs, or has, or is presumed to have, incurred or bonded debt under bonded labour system), and bonded labour system is defined in detailed as follows:

System of forced labour under which a debtor enters, into an agreement with the creditor:

a) in consideration of an advance obtained by him or by any of his lineal ascendants or descendants (whether or not such advance is evidenced by any document) and even interest on the amount taken, or
b) in pursuance of any customary or social obligation, or
c) in pursuance of an obligation devolving on him by succession or
d) by reason of his birth in any particular caste or community

Debtor would:

1) render labour or service to the creditor or for the benefit of the creditor, for a specific period or for an unspecified period, either without wages or for nominal wages or less than rates fixed minimum by Government,
2) forfeit the right of movement freely in India, forfeit the right to sell at market value any of his property or labour,

Section 4 abolished this practice totally from India and all bonded laborers are free. No person shall make advance under the bonded labour system, or compel any person to render any bonded labour or other form of forced labour. Section 6 extinguished the liability to repay bonded debt. Property of bonded laborers to be freed from mortgage, etc (Sec 7), and they will not be evicted from homeshed. Vigilance Committee for every districts in all states should be constituted having members from different sections of the society headed by District Magistrate. Anybody who compel or sustain bonded laborer may be punished with imprisonment for a term which may extend to three years and also with fine which may extend to Rs. 2000.

THE TRADE UNION ACT, 1926

The Trade Union Act , 1926 was enacted in pre-independent India with the objects of promoting social justice among workers. In 1987, the Government of India made some amendment in the Act. The trade union can be formed with a minimum of 7 members as executive members and get it register in prescribed format with the Registrar. Twenty five percent of the total workforce of an establishment would be required for registration as a trade union. Membership fee and other contributions are the only source of its fund which could be utilized for salaries, for administrative expenses and for providing any allowances to its members in case of death, old age, sickness, accidents, etc.

The Act has granted immunity from criminal prosecution for any agreement made between the members for purpose of achieving the objectives of the union. Suit against an office-bearer or a member of a trade union cannot be filed in a civil court. The Union members work for the benefit of workers and anything happened in the course of a trade dispute should be solved by the workers union only until the activities is criminal in nature.

THE DANGEROUS MACHINE (REGULATION) ACT, 1983

The Dangerous Machine means any machine (including power thresher) intended to be used in the industry, agriculture, or rural sector or any other sector when operated by an individual can cause death, dismemberment of any limb or other bodily injury arises during its operation. The state government shall, by notification in the Official Gazette, appoint a controller or Deputy or Assistant controller for carrying out the provisions of this Act (Sec.5). Such person has authority to issue, renewal and cancellation of licenses to the manufacturers and dealers of such dangerous machines. No such manufacturer or dealer will carry business, unless he holds a valid license (Sec. 9). Manufacturer has to ensure that every part of the dangerous machine conforms to prescribed standards (Sec.13). Such machine should have sufficient safeguards, instruction and signals imprint on the machine. User should get this machine registered (Sec. 19) and it is the responsibility of employer to give compensation in case of accidents (Sec. 22). In section 24, it is provided that employer can get insured the dangerous machine or workers working on it to pay the compensation if accident or injury occur.

References

Bhagoliwal TN. Economics of labor and industrial relations. Sahitya Bhawan, Agra 1995: 623-633.

Bureau of Labor Statistics. Labor Force Statistics derived from current Population Survey. Bulletin 2307 United States

Department of Labor, Washington DC 1988: 567.
ESI act amedments 2010. Available from http://labour.nic.in/upload/uploadfiles/files/divisions/social_security/esi%20%28amendment%29%20act%2020100001.pdf
Employees' State Insurance Act, 1948 along with Employees State Insurance Regulation 1950 amended as on 2004. Commercial Law Publishers (India) Pvt. Ltd. 2002.
Employees' State Insurance Corporation-India. Occupational Diseases-Prevention, Detection and Control udner ESI scheme of India, Panchdeep Bhawan, CIG Road, New Delhi 110002.
Employees' State Insurance Corporation, Ministry of Labour and Employment, Government of India: Social Security for Working Class. Hindustan Times 2010 March 10; 12-13.
Gazette of India. The Mines Act, 1952. Government of India.
Gazatte of India. Contract Labor (Regulation and Abolition) Central Rules, 1971: Construction and Maintenance of Creches. [Notification No. S.O. 143 dated 8th. September, 1972 published on 13th. January, 1973].
Gazette of Delhi. The minimum wage Act 1948, Department of Labor, Govt. of NCT Delhi revised w.e.f. 1.2.2007.
Govt. of India. India 2005. Ministry of Information and Broadcasting, Publications Division 2005.
Govt of India. The Factories Act, 1948; Act No. 63 of 1948. New Delhi: Commercial Law Publishers (India) Pvt. Ltd.2002.
Kartikeyan S, Gurav RB. Gender Issues in Employment. Indian Journal of Occu & Environmental Medicine 2002; 6 (1): 37-41.
Malhotra R, Lal P, Prakash S, Daga MK, Kishore J. Profile of foodhandlers working in food services establishment located within the premises of a medical college in Delhi, India. Public Health 2007; 121:455-461.
Phoon WO. Practical Occupational Health. Singapore: PG Publishing 1988: 287-290 and 335.
Stell JM. The working environment of the working poor – Analysis based on workers compensation claims, census data and known risk factors. Women's Health 1987; 13(3/4): 83-101.
United States Public Health Services. Report of Task Force on Women;s Health Issues. Public Health Reports 1988: 100 (1): 73-106.
Vallinmaki J. Ozne stalks where you least expect it. Work and Health Safety, Finnish Institute of Occupational Health, Hilsinki, Finland 1997: 30-31.
Women's Bureau. Twenty Facts on Women Workers. Fact Sheet No. 88-2. United States Department of Labor Washington DC 1988: 1-2.

CHAPTER 75

ENVIRONMENTAL HEALTH LEGISLATION

INTRODUCTION

All organisms from virus to man are obligatorily dependent on the environment for food, energy, water, air, shelter and for other essential and nonessential needs. But when this environment is not available in its natural or suitable composition then the organism whether plant or animal, living or nonliving component may change its form or disappear. This state may be disease or deformity or disability or death. The environment is the total sum of living, nonliving components, influences and events, surrounding an organism.

Environment is not static. It keeps on changing. All factors are in a flux and keep changing continuously. Each component has its range of tolerance. The environment can be External or Internal. This can be classified as Natural or Artificial (Man-made). Human activities have greatly changed the natural environment. Examples of artificial environment are cultivated fields or cities, dams, canals, parks, etc. Furthermore to make life comfortable modern equipments like fan, fridges, radio, television, air conditioning, transportation, etc. are invented which are produced in large quantity in industries. Man has evolved in terms of accumulation of artificial materials such as motor cars, air conditions, aeroplanes, fridges, etc., which has become a problem too. These problems are not limited to man only but whole planet has got set back for its future due to climatic changes.

Pollution refers to any undesirable change in the physical, chemical or biological characteristics of our environment, i.e. air, water, and soil that may or will adversely affect humans or other species and life support systems of our biosphere directly or indirectly. Usually we try to forget the social and psychological environment when we talk of environmental pollution. Diet, alcohol use, risk behavior, crime, and many other similar factors could be considered as environmental. For the basic understanding the major causes of pollution can be classified as:

1. Fossil Fuel consumption
2. Motor transport
3. Modern agriculture
4. Industries

Loss of Biodiversity: It has been estimated that 27,000 species a year are currently being lost in tropical forests alone; together with other habitats primarily coral reefs, wet lands, islands and mountain environments, the total is estimated at 30,000 a year. In state of poverty people use these natural resources more often and pose threat by destroying to the biodiversity.

Impact on Human Health

The environment influences the health of people in many ways – through exposures to various physi-cal, chemical and biological risk factors. The five environmental exposures quantified in this report together account for nearly 10% of deaths and dis-ease burden globally (Table 75.1), and around one quar-ter

of deaths and disease burden in children under 5 years of age.

In India, about 27% of DALYs lost and about 30% of the deaths can be attributed to the environmental related diseases. The average Indian loses about 124 days of healthy life per year due to environmental diseases. There are many examples showing relationship between environmental pollution and public health:

Water and Sanitation

Approximately, 80-90% of untreated sewage is discharged directly into rivers and streams, which are the main source of water supply in cities (Tibbetts 2000). Human feces remains one of the world's most dangerous pollutants, spreading microbes that cause typhoid, cholera, diarrheal illness, amoebic dysentery, and other virulent disease (WHO 1999). In Delhi, for example, the Coliform count in the city's main river, the Yamuna, increases 3000 fold from the time it enters the city to the time it leaves (Hardoy et al 1992). That stretch of the river also receives about 20 million liters of industrial effluents.

Traffic

Dangerous roads and heterogeneous traffic in urban areas are common. There is *an injury every second minute and fatality* on road every ninth minutes in India, i.e., 156 people die every day. It is seventh leading causes of death. In the most productive age groups of 15-44 years it is third leading cause (WHO 1999). Road traffic injuries are the most common and mainly confined to urban areas. Available information and technology in developed world may be transferred to expedite the measures of traffic injury prevention and control.

Industrialization

One of the components of urbanization is industrialization. These two processes are resulting to poor air quality in cities. Delhi's air quality, for example, especially in the winter months, is among the worst in the world (World Resource Report 1998-99). Use of chemicals has also increased many folds. Chemical toxicity can occur which may cause infection, *cancers* and *birth defects* (Env Health Persp 2000). Large numbers of migrant workers coming to urban areas in search of work get settled in slum, or remain on street.

Table 75.1: Deaths and DALYs attributable to five environmental risks, and to all five risks combined by region, 2004.

Risk	World	Low and middle income	High income
Percentage of deaths			
Indoor smoke from solid fuels	3.3	3.9	0.0
Unsafe water, sanitation, hygiene	3.2	3.8	0.1
Urban outdoor air pollution	2.0	1.9	2.5
Global climate change	0.2	0.3	0.0
Lead exposure	0.2	0.3	0.0
All five risks	**8.7**	**9.6**	**2.6**
Percentage of DALYs			
Indoor smoke from solid fuels	2.7	2.9	0.0
Unsafe water, sanitation, hygiene	4.2	4.6	0.3
Urban outdoor air pollution	0.6	0.6	0.8
Global climate change	0.4	0.4	0.0
Lead exposure	0.6	0.6	0.1
All five risks	**8.0**	**8.6**	**1.2**

Many of them live in the factories where they work. They do not appreciate the risk involved in doing so.

There is a potential for increased malignancies risk from exposure to chromium, nickel, cadmium and other pollutants present in urban environment. Chlorinated water consumption also poses health risk but benefits of chlorination due to control of water borne diseases are more than the risk (Yang 1998, Gurjar 1996).

Air

London smog episode killed 2500 people in 1952. Similarly, Bhopal gas leak (methyl isocyanate) killed thousands of people and disabled many more in 1984. Increase in carbon dioxide has severe effects like disturbance in greenhouse gases that can lead to global warming. Other causes of air pollution such as ozone depletion, acid rain, and photochemical smog have much wider effect on life on this planet. Volatile Organic Compounds (VOCs) are mix of benzene, toluene, xylene, styrene and butadine. They react in atmosphere with the sunlight and Nox to give smog. These compounds are released from paint thinners, dry cleaners solvents, and some constituents of petroleum fuels. Benzene levels, in particularly, can increase from emissions from burning coal and oil, motor vehicle exhaust, and evaporation from gasoline service stations. As tobacco contains high level of benzene, tobacco smoke is another source of benzene. Exposure to VOCs can cause eye allergy, choke upper respiratory tract, lead to nasal congestion, rash, drowsiness, dizziness, nausea, rapid heart rate, headache, tremors, confusion, and unconsciousness. Benzene has been branded as potential carcinogen and on long term exposure of even 1mg/m3 of benzene can causes leukemia in four in one million people on life. Benzene is found many times higher (47 mg/m3 in Delhi) as compared to global standards of 5-16mg/m3. India has not yet set an ambient air quality standard for benzene or other VOCs.

Air pollution in urban areas is seriously affected by transport, industries, domestic fuel burning, and tobacco smoking. The health risks associated with air pollution and passive smoking appear more severe than radiation exposure which is considered very severe.

Indoor Air pollution

In India, 85% of total household and 97% of the rural population use biomass fuel and coal. It is estimated that 4-5.5 lakh premature deaths are occurring annually in India from indoor air pollution exposure especially among children under 5 and adult women. 12-20 million Disability Adjusted Life Year are lost due to indoor air pollution in India (World Bank).

Solid waste and Biomedical Waste Management

On an average 0.2-0.5 Kg of solid waste per capita per day is generated in the Indian cities (Bhoyar et al 1996), and the civic authorities collect about 35 million tons of municipal solid waste every year (Palnitkar 2000). Over 6000 tons of solid waste generated in Delhi alone everyday. Of this, less than 1% of this waste is generated by health delivery system. There are estimates that total amount would increase to 17,000 tons by 2021. Similar observations are made in other metropolitan cities. There is an urgent need to launch a waste minimization program and to have safe disposal of specialized waste like Biomedical waste generated from hospitals (Kishore 2000), slaughter' houses, thermal power plants, etc. Due to mismanagement most of hazardous waste find its way to landfill site, which causes many health hazards, for example congenital anomalies in women living near these sites (Doll 1998). As compare to general workers the conservancy workers and ragpickers are more prone to develop upper and lower respiratory symptoms, breathlessness on exertion, dry cough, chest discomfort or pain and impairment of lung and liver functions; they suffer more from cuts and pricks, developed tingling or numbness, transient memory loss, depression and irritability, vertigo. Higher level of eosinophilia, neutrophilia, lymphocytosis indicates bacterial, viral and fungal infections in them. There are immunological deficiencies, decline in erythrocyte superoxide dismutase, enzyme level, and genetic changes in these workers (Lahiri et al 2007).

E-Waste

E-Waste broadly covers waste from all electronic and electrical appliances and comprises of items such as computers, mobile phones, digital music recorders/players, refrigerators, washing machines, television and many other household consumer items. India generate approximately 1,46,000 tonnes to 3.3 lakh tonnes of e-waste in a year and is expected to touch 8 lakh tonnes by 2012. E-waste contains more than 1000 different substances, which fall under "hazardous and non hazardous categories. Broadly, it consists of ferrous and non-ferrous metals, plastic, glass, wood and

plywood, printed circuit boards, concrete and ceramics, rubber and other items. Iron and steel constitutes about 50% of the e-waste constituents. Non-ferrous metals, e.g. silver, gold, platinum, palladium, etc. The presence of elements like lead, mercury, arsenic, cadmium, selenium, barium and hexavalent chronium and flame retardants beyond thresold quantities in e-waste classfied them as hazardous waste (Pinto VN 2008). These harmful substances (HT 2009 29th August) can cause on exposure: a) damage to central and peripheral nervous systems, blood systems and kidney; b) affect development of brain; c) teratogenic (affect development of fetus in womb); d) respiratory and skin disorders; e) DNA damage; and f) muscle weakness. For e-waste various interventions are required such as technical -product design and engineering intervention, waste minimization, restructuring recycling, policy level intervention, take back policy, capacity building, protective protocol for workders in e-waste disposal, awareness building, etc (Monika 2010).

Chemical disasters

Chemical Disasters are also increasing in numbers in urban industries due to poor monitoring, mismanagement and lack of implementation of regulation. Lot to be learned from Bhopal Gas tragedy.

Radiation and Nuclear Pollution

There is serious risk of radiation such as observed in Hiroshima and Nagasaki, leakage from Chernobyl reactor in USSR, leakage in Columbia, USA, and in France. The main effects are: cancers of various parts of the body, blood cancers, skin diseases, cataract, immune system disorders, etc.

Noise Pollution

The development of society has led to more and more sound sources giving higher and higher noise level. It did not create much public concern, compared to either air or water pollution mainly due to insufficient study of the problem and more because of ignorance of public in general about the insidious and progressive health effect of noise on both workers in the industry in particular and the public in the community in general.

Population Explosion

In India, the urban population is reached presently to around 30%. In absence of good public transport, the number of vehicles has increased exponentially, leading to deteriorating environmental conditions in all major cities in the countries.

There are many provisions in the Constitution of India to safeguard the environment and state is made responsible for this. At the same time there is growing influence of the international bodies to regulate the country's environmental pollution not only for the safety of its own people but also to mitigate its effect on whole planet. Centrally sponsored program on prevention of occupational diseases started recently indicating the commitment of government for safe environment. There are many Acts in the country to protect the environment and mankind. These are as follows:

1986 – The Environment (Protection) Act authorizes the central government to protect and improve environmental quality, control and reduce pollution from all sources, and prohibit or restrict the setting and /or operation of any industrial facility on environmental grounds.

1986 – The Environment (Protection) Rules lays down procedures for setting standards of emission or discharge of environmental pollutants.

1989 – Hazardous waste (Management and Handling) Rules objective is to control generation, collection, treatment, import, storage and handling of hazardous waste.

1989 – The Manufacture, Storage and Import of Hazardous Chemical Rules defines the terms used in this context, and sets up an Authority to inspect, once a year, the industrial activity connected with hazardous chemicals and isolated storage facilities.

1989 – The Manufacture, Use, Import,, Export and Storage of hazardous Microorganisms/ Genetically Engineered Organisms or Cells Rules were introduced with a view to protect the environment, nature and health, in connection with the application of gene technology and micro organisms.

1991 – The Public Liability Insurance Act and Rules and Amendment, 1992 was drawn up to provide for public liability insurance for the purpose of providing immediate relief to the persons affected by accident while handling any hazardous substance.

1995 – National environmental Tribunal Act has been created to award compensation for damages to persons, property and the environment arising from any activity involving hazardous substances.

1997 – The National Environment Appellate Authority Act has been created to hear appeals with respect to restrictions of areas in which classes of industries are carried out or prescribed subject to certain safeguards under the EPA (Environment Protection Act).

1998 – Biomedical waste (Management and Handling) Rules is a legal binding on the health care institutions to streamline the process of proper handling of hospital waste such as segregation, disposal, collection and treatment.

Forest and wildlife

1927 – Indian Forest Act and Amendment 1984 is one of the many surviving colonial statutes. It was enacted to 'consolidate the law related to forest, the transit of forest produce and the duty leviable on timber and other forest produce.

1972 – Wildlife Protection Act, Rules 1973 and Amendment 1991 provides for the protection of birds and animals and for all matters that are connected to it whether it be their habitat or the waterhole or the forest that sustain them.

1980 – The Forest (Conservation) Act and Rules 1981 provides for the protection of and the conservation of the forests.

Water

1882 – The Easement Act allows private rights to use a resource i.e. groundwater, by viewing it as an attachment to the land. It also states that all surface water belongs to the state and is a state property.

1897– Indian Fisheries Act establishes two sets of penal offences whereby the government can sue any person who uses dynamite or other explosive substance in any way (whether coastal or inland) with intent to catch or destroy any fish or poisons fish in order to kill.

1956 – The River Boards Act enables the states to enroll the Central Government in setting up an Advisory River Board to resolve issues in inter state cooperation.

1970 – Merchant Shipping Act aims to deal with waste arising from ships along the coastal areas within a specified radius.

1974 – The Water (Prevention and Control of Pollution) Act establishes an institutional structure for preventing and abating water pollution. It establishes standards for water quality and effluent. Polluting industries must seek permission to discharge waste into effluent bodies. The Pollution Control Board (CPCB) was constituted under this act.

1977 – The Water (Prevention and Control of Pollution) Cess Act provides for the levy and collection of cess or a fees on water consuming industries and local authorities.

1978 – The Water (Prevention and Control of Pollution) Cess Rules contains the standard definitions and indicate the kind of and location of meters that every consumer of water is required to affix.

1991 – Coastal Regulation Zone Notification puts regulations on various activities, including construction, are regulated. It gives some protection to the backwaters and estuaries.

Air

1948 – Factories Act and Amendment in 1987 was the first to express concern for the working environment of the workers. The amendment of 1987 has sharpened its environmental focus and expanded its application to hazardous processes.

1981 – Air (Prevention and Control of Pollution) Act provides for the control and abatement of air pollution. It entrusts the power of enforcing this act to the Central Pollution Control Board.

1982 – Air (Prevention and Control of Pollution) Rules defines the procedures of the meetings of the Boards and the powers entrusted on them.

1962 – Atomic Energy Act deals with the radioactive waste.

1987 – Air (Prevention and Control of Pollution) Amendment Act empowers the central and state pollution boards to meet with grave emergencies of air pollution.

1988 – Motor Vehicles Act states that all hazardous waste is to be properly packaged, labeled and transported.

THE ENVIRONMENT (PROTECTION) ACT, 1986
[Act No. 29 of Year 1986]

The Constitution of India, Article 48A, specify that the State shall endeavor to protect and improve the environment and to safeguard the forests and wildlife of the country and every citizen shall protect the environment (51A). It shall be the duty of every citizen of India: (f) To value and preserve the rich heritage of our composite culture; (g) To protect and improve the natural environment including forests, lakes, rivers and wildlife and have compassion for living creatures. The United Nations Conference on the Human Environment held at Stockholm in June, 1972, in which India participated. It is considered necessary further to implement the decisions aforesaid insofar as they relate to the protection and improvement of environment and the prevention of hazards to human beings, other living creatures, plants and property. Because of these reasons the Environment (Protection) Act 1986 was placed in front of the Parliament and enacted to provide for the protection and improvement of environment and for matters connected therewith. This Act is applicable to whole India (Sec 1).

The Act defines (Sec 2) following definitions:

(a) "environment" includes water, air and land and the interrelationship which exists among and between water, air and land, and human beings, other living creatures, plants, microorganism and property;

(b) "environmental pollutant" means any solid, liquid or gaseous substance present in such concentration as may be, or tend to be, injurious to environment;

(c) "environmental pollution" means the presence in the environment of any environmental pollutant;

(d) "handling", in relation to any substance, means the manufacture, processing, treatment, package, storage, transportation, use, collection, destruction, conversion, offering for sale, transfer or the like of such substance;

(e) "hazardous substance" means any substance or preparation which, by reason of its chemical or physicochemical properties or handling, is liable to cause harm to human beings, other living creatures, plants, microorganism property or the environment;

(f) "occupier", in relation to any factory or premises, means a person who has control over the affairs of the factory or the premises and includes, in relation to any substance, the person in possession of the substance;

The Act provide powers to make rules to regulate environmental pollution, to notify standards and maximum limits of pollutants of air, water, and soil for various areas and purposes; prohibition and restriction on the handling of hazardous substances and location of industries (Sections 3-6). The Central Government is empowered to constitute authority or authorities for the purpose of exercising or performing such of the powers and functions (Sec 3), appoint a person for inspection (Sec 4), for analysis of samples and for selection or notification of environmental laboratories.

No person carrying on any industry, operation or process shall discharge or emit or permit to be discharged or emitted any environmental pollutant in excess of such standards as may be prescribed (Sec 7) or handle hazardous substance without adequate safeguard (Sec 8). Any person empowered by the Central Government shall have a right to enter, at all reasonable times any place for the purpose of examining/seizing and testing any equipment, industrial plant, record, register, document or any other material object or for conducting a search of any building in which he has reason to believe that an offence under this Act or the rules made thereunder has been or is being or is about to be committed that is necessary to prevent or mitigate environmental pollution (Sec 10). Occupier must assist such person for carrying out the job (Sec 10 [2]). The Central Government or any officer empowered by it in this behalf, shall have power to take, for the purpose of analysis, samples of air, water, soil or other substance from any factory, premises or other place in such manner as may be prescribed (Sec 11).

The Government shall establish/recognize one or more environmental laboratories and analysts for the purpose of analysis who shall give report in specified manner (Sec 13,14);

According to the section 5, the Central Government may issue directions in writing to any person or officers or any authority to comply. There could be closure,

prohibition of the supply of electricity or operation or process; or stoppage or regulation of the supply of electricity or water or any other service.

Persons carrying on industry, operation etc. are not to allowed emission or discharge of environmental pollutants in excess of the standards (Sec 7). Persons handling hazardous substances must comply with procedural safeguards (Sec 8) and occupiers must furnish the information to authority.

Penalty

Whoever, person or owners/occupier of companies, factories or whichever source found to be the cause of pollution may be liable for punishment for a term which may extend to five year or with fine which may extend to one lac rupees or both (Sec 15, 16, 17). If this is not comply with, a fine of Rs. 5000 per day extra and if not complied for more than one year then imprisonment may extend up to 7 years. Section 17 specify that Head of the department/in-charge of small unit may be liable for punishment if the owner/occupier produce enough evidence of innocence. The CPCB or state boards have power to close or cancel or deny the authorization to run the factory/institution/hospital whichever is causing pollution. No suit, prosecution or other legal proceedings shall lie against government officer who can exercise power in good faith in pursuance of this Act (Sec 18).

BIOMEDICAL WASTE MANAGEMENT RULES 2015

Introduction

The greatest risk of biomedical waste is from the infectious, and sharp components of the waste because Health Care Workers (HCW) and people associated with handling waste are often getting needle prick injuries (Kishore 2000) and can contract HIV/AIDS, Hepatitis B and C (Chamberland et al 1991). In other studies it is found that needle stick injuries are as common as 79.5% in their lifetime career (Sharma 2010; Kermode et al 2005; Singru et al 2008). The average number of needle stick injuries per health care worker per year ranged from 0.2-4.7 (Sharma 2010). Also all the health care providers who perform invasive procedures with sharp instruments are at risk for injury; however, the operating room setting presents the greatest risk. Surgeons in training have the greatest risk of exposure to blood-borne pathogens, given their numerous encounters involving the use of sharp instruments on patients and the increased propensity for injury while learning new technical skill sets. In one study the majority of the injuries occured not during use itself, but rather during the handling between use and its disposal (Sharma 2010, Kermode 2005). Half of the workers who reported needlestick injuries reported that they were fatigue due to long working hours. The hazard of injury is further compounded by the high prevalence of HIV, Hepatitis B & C among hospitalized surgical patients. The mean number of needlestick injuries during residency increased according to the postgraduate year. By their final year of training, 99% of residents had a needlestick injury; for 53% the injury had involved a high risk patient (Makary MA 2007). In another study from Kolkata it was found that 61.4% of the nurses sustained at least one needle stick injury in last 12 months in which disposable, reusable and suture needles were involved (Joardar GK et al 2008). According to our observations and later reported by Sharma (2010) most of the injuries occured during recapping.

Risks in hospitals or health care settings are very high to the patients (nosocomial and infectious infections) and health care workers. *Nosocomial Infection* (syn: hospital acquired infection) is an infection originating in a medical facility, e.g., occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission. Includes infections acquired in the hospital but appearing after discharge; it also includes such infections among staff.

Indiscriminate disposal of hospital needles and other sharps increase the chances of injuries among waste handlers and patients (Weltman et al 1995, Khuri et al 1997).

In addition to infectivity of the biomedical waste, its highly toxic and variable radioactivity has increased public concern about treatment, transportation and ultimate disposal. At many places, authorities are failing to install appropriate systems due to non-availability of technologies, inadequate financial resources and

COLOR CODING AND TYPE OF CONTAINER FOR DISPOSAL OF BIOMEDICAL WASTE

Category	Type of Waste	Type of bag	Treatment & Disposal options
Yellow	Human anatomical waste Human tissue, organs, body parts fetus below viability Animal Anatomical waste	Yellow color non-chlorinated plastic	Incineration or plasma pyrolysis or deep burial
	Soiled Waste: itemscontaminated with blood, body fluids- dressing, plaster cast, cotton swabs & bags		in absence of above facilities autoclaving or microwaving or hydroclaving followed by shred or mutilation or combined. Treated waste for energy recovery
	Discarded linen, matresses, bedding contaminated with blood or body fluids	non-chlorinated plastic bags	as above
	Expiry or discarded drugs including cytotoxic drugs along with glass or plastic ampoules, vials, etc		Returns to manufacturers or Inciration > 1200 degree C or Encapsulation or Plasma Pyrolysis
	Chemical waste: biological, disinfect Chemical liquid waste: silver X-rays film developer, formalin, infected secretion, aspirated fluids, lab & floor washing, cleaning, etc	Separate collection system leading to effluent treatment system	Pre-treatment before mixing with other waste water.
	Microbiology, Biotechnology, Clinical Lab Waste	Autoclave safe plastic bags/ containers	Pre-treat to sterilize onsite with non-chlorinated chemicals as WHO/NACO guidelines
Red	Contaimnated recyclable waste: tuing, bottles, IV tubes set, catheters, urine bags, syringes without needles, gloves	Red Colored non-chlorinated	Autoclaving/Micro-waving Hydroclaving followed by shredding, mutilation or both; send registered recyclers
White	Waste Sharps including metals needles, syringes with fixed needles scalples, blades, etc	Puncture & leak proof,	Autoclave or dry heat sterilization followed by shredding/mutilation encapsulation in metal or cement concrete container; send to iron foundries or sanitary landfill
Black	Glassware: Broken or discared and contaminated glass, vials and ampoules except cytotoxic drugs	Cardboard boxes with blue colored marking	Disinfection by Hypochlorite treat or lean detergent or autoclave or microwave or hydroclave and then send to recyclining
	Metallic body implants		

***Disposal by deep burial is permitted only in rural or remote areas where there is no access to common bio-medical waste treatment facility. This will be carried out with prior approval from the prescribed authority and as per the Standards specified in Schedule-III. The deep burial facility shall be located as per the provisions and guidelines issued by Central Pollution Control Board from time to time.**

absence of professional training on waste management (Patil 2001). In addition the awareness is poor among various categories of health workers and medical students about environmental health including biomedical waste management (Kishore 2000, 2002, Pandit et al 2005, Jahnavi 2006). It has been observed that Safety equipments are neither available nor used by health care workers in the hospital. In one of the studies 65% of the places in hospital needle destroyers were not available; 62% of the doctors were not using gloves (Jahnavi 2006). In amother study it is found that 60.9% washed the site of injuriy with water and soap and only 14.8% did nothing following injury. Only 7.8% of the health care workers took post-exposure prophylaxis against HIV/AIDS after their injuries and just 27.5% reported their injuries to their authorities (Sharma 2010). In one of the reports of Association Chambers of Commerce and Industries of India (ASSOCHAM) the NCR of Delhi, NOIDA, Gurgaon generate 2400 tonnes of Biomedical waste and there is no proper management facilities.

Because of concerns about biomedical waste generated at national and international level, the Union Ministry of Environment and Forest, Government of India has notified "Biomedical Waste (Management and Handling) Rules, 1998" amended on 2nd June 2000 and draft amended 2011 and finally Biomedical Waste Management Rules 2016 under the provision of Sections 6, 8, 25 of the Environment (Protection) Act, 1986 sections. As a result of this, all hospitals and nursing homes have implemented these rules and guidelines issued by the Central Pollution Control Board (CPCB 1998). However, it has been observed that biomedical waste management is a complex problem and one has to go further in the intricacy of management and attitude of the health workers. These rules do not applied on Radioactive waste, municipal waste, battery waste, hazardous waste because these all wastes have separate rules.

These rules shall apply to all persons who generate, collect, receive, store, transport, treat, dispose, or handle bio medical waste in any form including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, animal houses, pathological laboratories, blood banks, ayush hospitals, clinical establishments, research or educational institutions, health camps, medical or surgical camps, vaccination camps, blood donation camps, first aid rooms of schools, forensic laboratories and research labs.

These rules shall not apply to,-
(a) radioactive wastes as covered under the provisions of the Atomic Energy Act, 1962(33 of 1962) and the rules made there under;
(b) hazardous chemicals covered under the Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 made under the Act;
(c) solid wastes covered under the Municipal Solid Waste (Management and Handling) Rules, 2000 made under the Act;
(d) the lead acid batteries covered under the Batteries (Management and Handling) Rules, 2001 made under the Act;
(e) hazardous wastes covered under the Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008 made under the Act;
(f) waste covered under the e-Waste (Management and Handling) Rules, 2011 made under the Act; and
(g) hazardous micro organisms, genetically engineered micro organisms and cells covered under the Manufacture, Use, Import, Export and Storage of Hazardous Microorganisms, Genetically Engineered Micro organisms or Cells Rules, 1989 made under the Act.

Bio-medical waste means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps.

Duties of the Occupier (Sec 4)
"Occupier" means a person having administrative control over the institution and the premises generating bio-medical waste, which includes a hospital, nursing home, clinic, dispensary, veterinary institution, animal house, pathological laboratory, blood bank, health care facility and clinical establishment, irrespective of their system of medicine. The occupier shall:

- Get the authorization from CPCB or State Pollution Control Board;
- Take all necessary steps to ensure that bio-medical waste is handled without any adverse effect to human health and the environment;

- make a provision within the premises for a safe, ventilated and secured location for storage of segregated biomedical waste in colored bags or containers to ensure that there shall be no secondary handling, pilferage of recyclables or inadvertent scattering or spillage by animals and the bio-medical waste from such place or premises shall be directly transported to the common bio-medical waste treatment facility or for the appropriate treatment and disposal;
- pre-treat the laboratory waste, microbiological waste, blood samples and blood bags through disinfection or sterilisation on-site in the manner as prescribed by the World Health Organisation (WHO) or National AIDs Control Organisation (NACO) guidelines and then sent to the common bio-medical waste treatment facility for final disposal;
- phase out use of chlorinated plastic bags, gloves and blood bags within two years from the date of notification of these rules;
- The treated bio-medical waste shall not be mixed with municipal solid waste. Occupier shall provide training and immunize against Hepatitis B and tetanus (according to National Immunization Policy/MoHFW) and occupational safety to all its health care workers and others, involved in handling of bio medical waste at the time of induction and thereafter at least once every year and the details of training programmes conducted, number of personnel trained and number of personnel not undergone any training shall be provided in the Annual Report. He/she has to conduct annual health check up of all workers involved in Biomedical waste management. Annual report (including Nil in prescribed form) should also be submitted about accidents caused by fire hazards, blasts but exclude accidents like needle prick injuries, mercury spills;
- Occupier shall establish a Bar- Code System for bags or containers containing bio-medical waste to be sent out of the premises or place for any purpose within one year from the date of the notification of these rules. Maintain the daily records and upload the monthly report on their website (website should be made available within two years of notification);
- Liquid chemical waste need to be pre-treatment or neutralisation prior to mixing with other effluent generated from health care facilities. He/she has to ensure treatment and disposal of liquid waste in accordance with the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974).
- Untreated human anatomical waste, animal anatomical waste, soiled waste and, biotechnology waste shall not be stored beyond a period of forty –eight hours.
- Maintain all record for operation of incineration, hydro or autoclaving etc., for a period of five years. Incinerators should be according to specification given in rules. But will not establish such facilities on-site if common treatment facilities are available within 70km. A committee should be constituted which should meet six monthly and minutes should be submitted along with annual report.
- He/she shall inform the prescribed authority immediately in case the operator of a facility does not collect the bio-medical waste within the intended time or as per the agreed time.

Duties of the operator of a common bio-medical waste treatment and disposal facility (Sec 5)

The operator of a common bio-medical waste treatment facility means a person who owns or controls a Common Bio-medical Waste Treatment Facility (CBMWTF) for the collection, reception, storage, transport, treatment, disposal or any other form of handling of bio-medical waste. Every operator shall:

- Get the authorization from CPCB or State Pollution Control Board;
- take all necessary steps to ensure that the bio-medical waste collected from the occupier is transported, handled, stored, treated and disposed of, without any adverse effect to the human health and the environment, in accordance with these rules and guidelines issued by the Central Government or, as the case may be, the central pollution control board from time to time;
- ensure timely collection;

- establish bar coding and global positioning system within one year; modernizing equipments in two years of notification;
- inform the prescribed authority immediately regarding the occupiers which are not handing over the segregated bio-medical waste in accordance with these rules;
- provide training and assist occupier for conducting workers;
- annual medical examination and immunise all its workers for protection against diseases, including Hepatitis B and Tetanus;
- ensure occupational safety of all its workers ;
- report major accidents along with the annual report;
- maintain a log book for each of its whole process and maintain records of incineration, autoclave for 5 years;
- allow occupier, who are giving waste for treatment to the operator, to see whether the treatment is carried out as per the rules
- shall display details of authorisation, treatment, annual report etc on its web-site;
- supply non-chlorinated plastic coloured bags to the occupier on chargeable basis, if required;
- ensure designated vehicles for transportation;

The handling and disposal of all the mercury waste and lead waste shall be in accordance with the respective rules and regulations.

Every State Government or Union territory Administration shall constitute an Advisory Committee for the respective State or Union territory under the chairmanship of the respective health secretary to oversee the implementation of the rules in the respective state and to advice any improvements and the Advisory Committee shall include representatives from the Departments of Health, Environment, Urban Development, Animal Husbandry and Veterinary Sciences of that State Government or Union territory Administration, State Pollution Control Board or Pollution Control Committee, urban local bodies or local bodies or Municipal Corporation, representatives from Indian Medical Association, common bio-medical waste treatment facility and non-governmental organisation.

Every State Government or Union territory Administration shall constitute District Level Monitoring Committee in the districts under the chairmanship of District Collector or District Magistrate or Deputy Commissioner or Additional District Magistrate to monitor the compliance. Monitoring Committee shall also comprise of District Medical Officer or District Health Officer, representatives from State Pollution Control Board or Pollution Control Committee, Public Health Engineering Department, local bodies or municipal corporation, Indian Medical Association, common bio-medical waste treatment facility and registered nongovernmental organisations

Liability of the occupier, operator of a facility shall be liable for all the damages caused to the environment or the public due to improper handling of bio- medical wastes.

Penalty imposed on whosoever person or owners/ occupier found to be the cause of pollution. Punishment is for a term which may extend to five year or with fine which may extend to one lac rupees or both (Sec 15, 16, 17). If not complied with, a fine of Rs. 5000 per day extra and if not comply for more than one year then imprisonment may extend up to 7 years. Section 17 specify that Head of the department/in-charge of small unit may be liable for punishment if the owner/occupier produce enough evidence of innocence. The CPCB or state boards have power to close or cancel or deny the authorization to run hospital or any biomedical waste treatment facility whichever is causing pollution. Aggrieved person within thirty days of order may appeal to the authority.

Labelling of the bags and containers should be made according to specification given in the rules (Figure).

INCINERATORS

The Central Pollution Control Board has recommended two types of incinerators:

- Incinerators for individual hospitals/nursing homes/ medical establishments.
- Common incinerator to handle waste from a number of hospitals/nursing homes/pathological laboratories etc.

Emission Standards

Sl. No.	Parameter	Standards	
(1)	(2)	(3)	(4)
		Limiting concentration in mg Nm^3 unless stated	**Sampling Duration in minutes, unless stated**
1.	Particulate matter	50	30 or $1NM^3$ of sample volume, whichever is more
2.	Nitrogen Oxides NO and NO_2 expressed asNO_2	400	30 for online sampling or grab sample
3.	HCl	50	30 or $1NM^3$ of sample volume, whichever is more
4.	Total Dioxins and Furans	0.1ngTEQ/Nm^3 (at 11% O2)	8 hours or $5NM^3$ of sample volume, whichever is more
5.	Hg and its compounds	0.05	2 hours or $1NM^3$ of sample volume, whichever is more

Site for Incinerator

Incinerators should be installed at appropriate location to avoid nuisance to patients and neighborhood.

Standards for incinerators

All incinerators shall meet the following operating and emission standards:

Operating Standards

- Combustion efficiency (CE) shall be at least 99.0%
- The Combustion efficiency is computed as follows:

$$C.E. = \frac{\%CO_2 \times 100}{\% \ COS + \% \ CO}$$

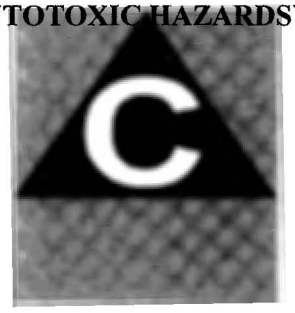
1. The temperture of the primary chamber shall be $800 \pm 50^{\circ}$ C.
2. The secondary chamber gas residence time shall be at least 1 (one) second at $1050^{\circ} \pm 50^{\circ}$ C, with a minimum of 3% Oxygen in the stack gas.

Delhi is home to an ever growing number of health care units and has 604 registered nursing homes,

LABEL FOR BIO-MEDICAL WASTE CONTAINERS or BAGS

HANDLE WITH CARE

CYTOTOXIC HAZARDSYMBOL



HANDLE WITH CARE

according to a census conducted in 2006, and has about 1,550 unregistered health care units with different names in the city. In addition to these, there are government hospitals, dispensaries, registered and unregistered nursing homes. The rule (amended in 2008) identifies biomedical waste subject to regulation; requires the registration of biomedical waste generators; and establishes packaging, labeling, handling, storage, transportation and treatment requirements. The rule does not establish disposal standards for biomedical waste because this rule defines treated biomedical waste as a special waste. The disposal of untreated biomedical waste is prohibited in this rule. The rule requires all transporters and owners or operators of transfer facilities and treatment facilities to obtain a license. The rule specifies siting, design, operating and reporting requirements and establishes a biomedical waste tracking or manifest system.

Phasing Out of Mercury Based Equipment

Mercury is used in thermometers, BP Apparatus, and in dental amalgams, etc. in health care establishments. Elemental mercury is a volatile metal that can cause severe harm when inhaled by human beings. Mercury released into the environment, easily and rapidly changes form to several organic and inorganic states that transfer from soil to air to water, and back again. the organic form of mercury, methylmercury, bioaccumulates in aquatic ecosystems to magnify concerntrations in animal tissues. The elemental mercury is a highly toxic substance which can vaporize easily and cause both acute and chronic health effects including severe respiratory irritation and damage to the central nervous system.

Delhi Pollution Control Committee has decided to phase out mercury based equipment in health care establishment and asked all owners and managers of the health care establishment to cooperate.

In the event of breakage of mercury containing medical equipment, necessary precautions shall be taken by the occuier to segregate such waste to the extent possible and also for its proper collection, storage and disposal as per guideline issued by the Government or according to Hazardous Waste (M&H abd Transboundary Movement) Rules 2008.

COMMENTS

Implementation of Biomedical Waste (Management & Handing) Rules is lacking due to various reasons such as lack of interest of management of waste, lack of interest in health and safety of hospital employees, lack of interest of doctors in environment issues, lack of expertise, soft corner of regulatory authorities for health department, etc. Regular inspection of health care facilities by the authorities is essential. Sometime, penalty has to be imposed on violator of the Rules but minimum. Nodal officers are not performing their duties due to their overburden of administrative work or due to their lack of experience. There is lot of corruption because of waste recycling business. 500 nursing homes, clinics and laboratories out of 1729 units in Delhi only have not applied for registration under BMW rules. Of these 27 only have effluent treatment plants and solar water heater (HT 24th Dec 2008).

MUNICIPAL SOLID WASTE (MANAGEMENT & HANDLING) RULES 2000

The generation of solid waste in urban areas has been increasing at a very rapid rate. The characteristic of solid waste is different from the waste generated in developed nations. It is more decompostable but low combustible because the moisture content is quite high and calorific value is quite low. On an average 0.2-0.5 Kg of solid waste per capita per day is generated in the Indian cities (Bhoyar et al 1996), and the civic authorities collect about 35 million tons of municipal solid waste every year Palnitkar 2000). Over 6000 tonnes of solid waste generated in Delhi alone everyday which is going to be estimated as 17,000 tonnes by 2021. Similar observations are made in other metropolitan cities. There are various reasons for poor management of solid waste in urban areas such as lack of fund, lack of technology, lack of awareness and people's participation, inadequate staff, etc. Under the EPA 1986 to safeguard the environment and human health Govt. of India has laid down Municipal Solid Waste Management Rules.

These Rules lay down the responsibility of management of solid waste disposal and various

standards for disposal of treated leachate (liquid that seeped through solid waste and other medium and has extracted dissolved or suspended material from it). The Rules also define terms like "anaerobic digestion", "biodegradable digestion", "composting", "leachate", "vasode water", "vermicomposting", etc. The management of the solid waste has been made the responsibility of municipal authority under Rule 4. The District Magistrate/Deputy Commissioner shall have the over all responsibility for the enforcement of the provisions under these Rules.

Refuse derived fuel technology has been advocated by the government that produces energy by incinerating wastes. The wastes is pressed into pellets and fed into the plant. Only waste with high energy content, like plastics make sense as energy option but burning plastic emits carcinogen such as dioxins into air. 60% of waste in India is picked up by ragpickers and very less plastics remain in municipal wastes so it is not a good option. On the other hand the European Union has already phased out incineration technology. By 2020, it is decided that 50% of municipal solid waste and 70% of the other waste must be recycled.

Characteristics of solid municipal waste:

- Developing-country waste is very low calorie
- Cost is 6-8 times higher than for composting.

  Control of air-pollution is very expensive, and necessary but rarely well-maintained
- Fails if debris and road-dust are in the waste Works against interests of recycling industry and thousands of waste-dependent workers.

Composting and Recycling

- Composting should be a legal requirement
- Compost marketing must be pro-active
- Cities must use their own composts for their parks, gardens and public buildings.
- No Sales Tax on soil bio-enricher products
- Investor-friendly policies like BOOT
- National Agriculture Policy to use compost
- Provide decentralised sorting-spaces
- Provide waste-pickers with ID cards
- Collect non-recyclable rejects for landfilling
- Give recognition and facilities to recyclers
- Give power concessions for pollution-control equipment
- Fill geographic gaps in recycling industries

Solid Waste Management Rules, 2015 draft has been published with more provisions and putting responsibility on generator of solid waste who could be individual household, institution, etc..

HAZARDOUS WASTE (MANAGEMENT & HANDLING) RULES, 1989

The powers conferred by Sections 6,8, and 25 of the Environment (Protection) Act 1986, the Central Govt. has made the following rules relating to hazardous wastes management and handling excluding waste water and exhaust gases (covered under Water Act 1974 and the Air Act 1981) and the waste arising out of the operation from ships beyond 5 kilometers (Merchant Shipping Act 1958), Radioactive wastes as covered under the provision of the Atomic Energy Act 1962.

Occupiers generating hazardous wastes as given in the list shall take all practical steps to ensure that such wastes as given in schedule are properly handled, i.e. collection, reception, treatment, storage, and its disposal of without any adverse effects to human health and environment (Rule 4). Such occupier shall apply for authorization in prescribed format to the State Pollution Control Board or Committees of UTs (Rule 5). After appropriate and satisfactory verification of facilities the authorization may be granted for a period of 2 years that would be subjected to the conditions and shall be renewed before expiry. State Pollution Control Boards have power to cancel the authorization or suspend if it is found that the occupier is not following the Provision of Rules. State government shall maintain the inventory of disposal sites and shall publish from time to time. The occupier shall maintain records of all operations and report to the State Boards.

All accidents related to the hazardous waste shall be reported in a separate form. Any type of importation of hazardous waste shall not be permitted for dumping

or disposal from other country except to those wastes which are examined and approved by the State Pollution Control Boards. However, such permission shall be communicated to the Central Government, Ministry of Environment and Forest (Rules 11 [1,2]). However, Supreme Court has directed "No import should be made or permitted to be made by the Government of any hazardous waste material which was already banned under the *International Basle* Convention or to be banned by the convention hereafter with effect from the date specified therein".

At present there are approximately 9000 units in the country which utilize hazardous wastes and nearly 10,000 authorizations for import of hazardous waste were made by the Government. Till now, not a single waste disposal site has been located in the country so far.

THE CHEMICAL ACCIDENTS (EMERGENCY PLANNING, PREPAREDNESS AND RESPONSE) RULES, 1996

Under the Environment (Protection) Act, 1986 are also framed. The Rules provide for mandatory preparation of On-Site Emergency Plans by the industry and Off-Site Plans by the district collector and the constitution of four tier crisis groups at the center, state, district, and local levels for the management of chemical disaster.

PUBLIC LIABILITY INSURANCE ACT, 1991

[Act No. 6 of Year 1991]

The Public Liability Insurance Act is an Act to provide for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling any hazardous substance and for matters connected therewith or incidental thereto. The Act defines following terms:

"Accident" means an accident involving a fortuitous or sudden or unintended occurrence while handling any hazardous substance resulting in continuous or intermittent or repeated exposure to death of, or injury to, any person or damage to any property but does not include an accident by reason only of war or radioactivity (Sec 2);

"Insurance" means insurance against liability; and
"Relief Fund" means the Environmental Relief Fund.
In case of death or injury to any person (other than a workman) or damage to any property has resulted from an accident, the owner shall be liable to give such relief as is specified in the Schedule. The claimant shall not be required to plead and establish that the death, injury or damage in respect of which the claim has been made was due to any wrongful act, neglect or default of any person

The Central Government may, by notification, establish a fund to be known as the Environmental Relief Fund (Sec 7A). The Relief Fund shall be utilized for paying, in accordance with the provisions of this Act, relief under the award made by the Collector.

Central Government may, in exercise of its powers and performance of its functions under this Act, issue such directions in writing as it may deem fit for the purposes of this Act to any owner or any person, officer, authority or agency and such owner, person, officer, authority or agency shall be bound to comply with such directions (Sec 12).

Penalty for contravention or failure to comply with directions

Whoever contravenes any of the provisions of the Act fails to comply with any direction issued, he shall be punishable with imprisonment for a term which shall not be less than one year and six months but which may extend to six years, or with fine which shall not be less than one lac rupees, or with both (Sec 14).

Conviction for the second time or any offence subsequent to the second offence, he shall be punishable with imprisonment for a term which shall not be less than two years but which may extend to seven years and with fine which shall not be less than one lakh rupees.

THE SCHEDULE [Section 3(1)]

(i)	Reimbursement of medical expenses incurred up to a maximum of Rs.12,500 in each case.
(ii)	For fatal accidents the relief will be Rs.25,000 per person in addition to reimbursement of medical expenses, if any, incurred on the victim up to a maximum of Rs.12,500.
(iii)	For permanent total or permanent partial disability or other injury or sickness, the relief will be (a) reimbursement of medical expenses incurred, if any, up to a maximum of Rs.12,500 in each case and (b) cash relief on the basis of percentage of disablement as certified by an authorized physician. The relief for total permanent disability will be Rs.25,000.
(iv)	For loss of wages due to temporary partial disability which reduces the earning capacity of the victim, there will be a fixed monthly relief not exceeding Rs.1,000 per month up to a maximum of 3 months: PROVIDED that the victim has been hospitalized for a period exceeding 3 days and is above 16 years of age.
(v)	Up to Rs.6,000 depending on the actual damage, for any damage to private property.

THE NATIONAL ENVIRONMENT TRIBUNAL ACT, 1995 [Act No. 27 of 1995]

This is an Act to provide for strict liability for damages arising out of any accident occurring while handling any hazardous substance and for the establishment of a National Environment Tribunal for effective and expeditious disposal of cases arising from such accident, with a view to giving relief and compensation for damages to persons, property and the environment and for matters connected therewith or incidental thereto.

This Act is the outcome of the United Nations Conference on Environment and Development held at Rio de Janeiro in June, 1992, in which India participated, calling upon the States to develop national laws regarding liability and compensation for the victims of pollution and other environmental damages. It is considered expedient to implement the decisions of the aforesaid Conference so as far they relate to the protection of environment and payment of compensation for damage to persons, property and the environment while handling hazardous substances.

Liability to pay compensation in certain cases on principle of no fault

In case of death of, or injury to, any person (other than a workman) or damage to any property or environment has resulted from an accident, the owner shall be liable to pay compensation for such death, injury or damage under all or any of the heads specified in the Schedule (Sec 3).

In any claim for compensation, the claimant shall not be required to plead and establish that the death, injury or damage in respect of which the claim has been made was due to any wrongful act, neglect or default of any person.

An application for claim for compensation (within five year of accident) may be made-

(a) by the person who has sustained the injury;
(b) by the owner of the property to which the damage has been caused;
(c) where death has resulted from the accident, by all or any of the legal representatives of the deceased;
(d) by any agent duly authorized by such person or owner of such property or all or any of the legal representatives of the deceased, as the case may be; (e) by any representative body or organization, functioning in the field of environment and recognized in this behalf by the Central Government, under all or any of the heads specified in the Schedule; or
(f) by the Central Government or a State Government or a local authority under all or any of the heads specified in the Schedule (sec 4) (Table 73.1);

The Central Government shall, by notification, establish a Tribunal, to be known as the National Environment Tribunal, to exercise the jurisdiction, powers and authority conferred on it by or under this Act (Sec 8). The Tribunal may take up the cases for claims for compensation suo motu. Any claimant making an application before the Tribunal may also make application for such relief as is provided in the Public Liability Insurance Act, 1991.

Table 73.1: THE SCHEDULE [See section 3(1)] HEADS UNDER WHICH COMPENSATION FOR DAMAGES MAY BE CLAIMED

(a) Death;
(b) Permanent, temporary, total or partial disability or other injury or sickness;
(c) Loss of wages due to total or partial disability or permanent or temporary disability;
(d) Medical expenses incurred for treatment of injuries or sickness;
(e) Damages to private property;
(f) Expenses incurred by the Government or any local authority in providing relief, aid and rehabilitation to the affected persons;
(g) Expenses incurred by Government for any administrative or legal action or to cope with any harm or damage, including compensation for environmental degradation and restoration of the quality of environment;
(h) Loss to Government or local authority arising out of, or connected with, the activity causing any damage;
(i) Claims on account of any harm, damage or destruction to the fauna including milt and drought animals and aquatic fauna;
(j) Claims on account of any harm, damage or destruction to flora including aquatic flora, crops, vegetables, trees and orchards;
(k) Claims including cost of restoration on account of any harm or damage to environment including pollution of soil, air, water, land and ecosystems;
(l) Loss and destruction of any property other than private property;
(m) Loss of business or employment or both;
(n) any other claim arising out of, or connected with, any activity of handling of hazardous substance;

The Tribunal shall have, and exercise, the same jurisdiction, powers and authority in respect of the matters specified in the Public Liability Insurance Act, 1991 as the Collector has and may exercise. Tribunal may summon and enforce the attendance of any person and examining him on oath.Whoever fails to comply with any order made by the Tribunal, he shall be punishable with imprisonment for a term which may extend to three years, or with fine which may extend to ten lac rupees, or with both (Sec 25).

AIR POLLUTION

Air pollution consists of gases and/ or particles. These have a distinct chemical or physical structure, or a distinct effect on human health. The main air contaminants are:

- *Sulphur dioxide (SO_2).* This contaminant is mainly emitted during the combustion of sulphur-containing fossil fuels, such as crude oil and coal. Sulphur dioxide concentrations in air have decreased in the past two decades, mainly because we use more non-sulphur-containing fuels for the generation of energy. Sulphur dioxide is a stinging gas and as a result it can cause breathing problems with humans. In moist environments, sulphur dioxide may be transferred to sulphuric acid. This acid causes acidification and winter smog.
- Nitrogen oxides (NO_x). These contaminants are emitted by traffic, combustion installations, such as power plants, and the industries. Nitrogen oxides are also released from farmland in the agricultural sector. Using catalysers in car exhausts can prevent emissions of nitrogen oxides. Nitrogen oxides are gasses that react with other air pollutants when they are present in air. For example, nitrogen oxides play an important rolein the formation of ozone in the lower atmosphere, and in acidification and eutrophication processes. They can deeply penetrate the lungs and damage human lung functions.

Atmospheric problems	SO_2	NOx	NH_3	VOC	CO	CH_4
Photochemical smog		+		+	+	+
Winter smog	+					
Acidification	+	+	+		+	
Eutrophication		+	+			
Climate change		+		+	+	+

- Ammonia (NH_3). Ammonia forms during agricultural activities. Ammonia plays an important role in acidification and eutrophication.
- VOC (Volatile Organic Compounds). VOC can be a range of different contaminants, such as carbohydrates, organic compounds and solvents. These compounds usually derive from petrol and gasoline reservoirs, industrial processes and fuel combustion, paint and cleanser use, or agricultural activities. VOC play an important role in ozone shaping in the lower atmospheric layer, the main cause of smog. VOC can cause various health effects, depending on the kind of compounds that are present and their concentrations. Effects can vary from smell nuisance to decreases in lung capacity, and even cancer.
- Methane (CH_4). The main source of methane pollution is agriculture. But smaller amounts of methane can also be released during waste combustion and natural gas extraction. Methane is a greenhouse gas that contributes to the greenhouse effect and ozone loss.
- Carbon monoxide (CO). This gas consists during incomplete combustion of fuels. When we let a car engine run in a closed room, carbon monoxide concentrations in the air will rise extensively. Carbon monoxide contributes to the greenhouse effect, smog and acidification. The gas can bind to hemoglobin in blood, preventing oxygen transport through the body. This results in oxygen depletion of the heart, brains and blood vessels, eventually causing death.
- Dust particles. Dust particles form a complex of organic compounds and minerals. These can derive from natural sources, such as volcanoes, or human activities, such as industrial combustion processes or traffic. Particles are categorized according to particle size. The smallest particles have the ability to transport toxic compounds into the respiratory tract. Some of these compounds are carcinogenic. The upper respiratory tract stops the larger dust particles. When they are released into the environment, dust particles can cause acidification and winter smog.
- Ozone (O_3). Ozone is created through photochemical transfer of oxygen. This process takes place under the influence of ultra violet sunlight (UV), aided by pollutants in the outside air. Ozone causes smog and contributes to acidification and climate change. Ozone is an aggressive gas. Which can easily penetrate the respiratory tract, deeply. When humans are exposed to ozone, the consequences may be irritation of the eyes and the respiratory tract.
- Radioactive radiation. Radioactive radiation and radioactive particles are naturally present in the environment. During power plant incidents or treatments of nuclear waste from a war where nuclear weapons are used, radioactive radiation can enter the air on account of humans. When humans are exposed to high levels of radioactive radiation, the chances of serious health effects are very high. Radioactive radiation can cause DNA alteration and cancer.

The main environmental effects of air pollution

The main environmental effects of air pollution are briefly summarized as follows:

Smog: Smog is a combination of the words smoke and fog. We can distinguish two separate types of smog, summer smog and winter smog. Photochemical smog, or summer smog, mainly consists of ozone. It is a brown, oxidising fog. The causes of photochemical smog are nitrogen oxides and VOC, which stem from traffic and industries. Ozone is formed according to the following chemical reactions:

$$NO_2 + uv \longrightarrow NO + O$$
$$O + O_2 \longrightarrow O_3$$

The reverse reaction is:
$$NO + O_3 \longrightarrow NO_2 + O_2$$

The best circumstances for the creation of high ozone concentrations are summer temperatures, direct sunlight and standing air layer, which enable dilution of contaminants.

Humans cannot adapt to smog. Health effects of smog greatly depend upon the concentrations of ozone and other photochemical oxidants. These contaminants cause eye and respiratory irritations. Plants are extremely vulnerable to ozone. Even in low concentrations it can cause serious damage.

Winter smog is also referred to as acid smog; it mainly consists of foggy elements. Winter smog is found in

areas where vertical dispersion of air pollutants is not possible. Usually temperatures decrease during the day in high air layers.

Heated air layers near the earths' surface rise, causing the air pollutants to be dispersed vertically, and to be diluted. In winter ground temperatures are sometimes lower than those of the upper atmospheric layers, causing the air to stay near the ground, so that pollutants will not spread. This causes winter smog.

Winter smog can form when temperatures are low and sulphur dioxide concentrations increase consequential to central heater emissions from houses.

The cold outside air will cause moist to condensate into fog. Aerosols in air play a part in this process, because they serve as condensation cores for water vapour.

Humidity aids the transfer of sulphur dioxide to sulphuric acid, causing the smog to be acid. Acid smog causes breathing problems and eye irritations.

Acid deposition: Acid deposition is not merely characterized as acid rain; it can also be snow and fog or gas and dust. Acid deposition mainly forms during fossil fuel combustion. When emissions of sulphur dioxide and nitrogen oxides come in contact with water, they will become sulphuric acid and nitric acid.

When acidifying agents, such as sulphur dioxide, nitrogen oxides and ammonia, end up in plants, surface water and soils, this has a number of consequences:

- Availability of nutrients and metal spores is likely to decrease.
- When acidity is high more metals will dissolve in water. This can cause surface water to become polluted, which has serious health effects on aquatic plants and animals. For example, high aluminum (Al) concentrations can complicate nutrients uptake by plants. This makes aluminum one of the prior causes of forest decay. Mercury can be dispersed by transport through surface water, causing it to accumulate in fish. Mercury can bio magnify up the food chain, to be taken up by humans eventually.
- Buildings and monuments may be damaged through erosion. Sulphur dioxide breaks down limestone by reacting with calcium carbonate, causing limestone to absorb water during rainfall. Limestone will than fragment.

Eutrophication: Eutrophication is caused by an increase in plant nutrients in water. The higher availability of nutrients causes certain water plants, such as algae and duckweed, to grow so extensively. This blocks sunlight supplies to water. The plants also use all available oxygen supplies, which will not be renewed because heterotrophic plants and bacteria need light to perform photosynthesis. Eutrophication causes ecosystem disruption. Nitrogen pollutants such as nitrogen oxides and ammonia contribute to this problem.

Ozone loss: Ozone is created everywhere in the atmosphere through chemical reactions under the influence of UV-light. Ozone is decomposed under the influence of visible light and UV-A light. During ozone decomposition an oxygen-poor molecule is released, which aids the breakdown of ozone. There are a number of compounds that catalyse ozone decomposition. Examples are hydroxide (OH), nitrogen oxides, chlorine (Cl) and bromine (Br).

Chlorine mainly aids the decomposition of ozone when it is a part of CFC-bonds (Chloro-Fluor-Carbohydrates). These compounds are not lost during the chemical reaction, causing them to decompose ozone multiple times.

The decomposition and production of ozone is a natural process. However, human activities have caused large concentrations of ozone-decomposing chemicals to enter the atmosphere, causing the natural balance to be disrupted.

Ozone is very important for all life on earth, because it absorbs harmful UV-B radiation from the sun. The highest concentrations of ozone are located in the atmospheric layer between twenty and forty kilometres above the earth. When the ozone concentrations in this layer decrease, UV-B radiation may reach the earth. This radiation damages DNA and causes skin cancer. The radiation can also damage the human immune system, causing humans to become more susceptible to infections. UV-B radiation also causes cataract and nearsightedness. The radiation

can decrease growth and photosynthesis activity in a number of plants. Primary crops, such as rice, corn and sunflower are very susceptible to this. Trees are also susceptible to the radiation.

UV-B radiation can affect aquatic life up to twenty metres under the water surface. It is damaging to species, such as plankton, fish larvae, shrimps, crabs and seaweeds. Phytoplankton forms the basis of the aquatic food chain. When radiation causes phytoplankton to decrease in number it will affect entire ecosystems.

Climatic change: The Greenhouse effect (GE) is due to release of gases, which have ability to trap the heat coming from sun. Therefore the temperature at surface of earth slowly rises and leading to global warming. This phenomenon affects the melting of ice, raising sea level and disturbance of rainfall etc.

The dispersion of air pollutants mainly depends on physical processes is air; those of wind and weather. How far air pollutants are transported mainly depends upon particle size of the compounds and at which height the pollution was emitted into the air. Fumes that are emitted into air through high smoke stags will mix with air so that local concentrations are not very high. However, wind will transport compounds and the pollution will become very disperse. Rain can remove pollutants from air. This causes precipitation and consequentially soil and water pollution.

For environmental agencies it is very important to determine exactly how an air pollutant spreads. Air is not a very complex medium. This enables us to predict the dispersion of air pollutants with computer models. In a computer model dispersion is calculated by means of different parameters, such as wind speed, wind direction, temperature, air humidity and cloudiness. These predictions are of great significance when we are dealing with toxic clouds or radioactive radiation, because these are a danger to human health and because inhabitants of polluted areas need to be warned.

AIR (PREVENTION AND CONTROL OF POLLUTION) ACT, 1981

[Act No. 14 of 1981]

The Air (Prevention and Control of Pollution) Act is an Act to provide for the prevention, control and abatement of air pollution, for the establishment, with a view to carrying out the aforesaid purposes, of Boards, for conferring on and assigning to such Boards, powers and functions relating thereto and for matters connected therewith. This Act is an outcome of the United Nations Conference on the Human Environment held in Stockholm in June, 1972, in which India participated, to take appropriate steps for the preservation of the natural resources of the earth which, among other things, include the preservation of the quality of air and control of air pollution. It extends to the whole of India. Act defines following terms:

- "air pollutant" means any solid, liquid or gaseous substance [including noise] present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment;
- "control equipment" means any apparatus, device, equipment or system to control the quality and manner of emission of any air pollutant and includes any device used for securing the efficient operation of any industrial plant;
- "emission" means any solid or liquid or gaseous substance coming out of any chimney, duct or flue or any other outlet;

The Central Pollution Control Board constituted under section 3 of the Water (Prevention and Control of Pollution) Act, 1974 (6 of 1974), shall, exercise the powers and perform the functions of the Central Pollution Control Board for the prevention and control of air pollution under this Act (Sec 3). Similarly State Pollution Control Boards shall function (Sec 4) whereas in Union Territories the central board shall function (Sec 6).

A Board may constitute as many committees consisting wholly of members or partly of members

and partly of other persons and for such purpose or purposes as it may think fit (Sec 11). The main functions of the Central Board shall be to improve the quality of air and to prevent, control or abate air pollution in the country (Sec 16). However, the board shall advise government, plan the program for prevention, coordinate, perform, organize all the activities or delegate, lay down standards of air and collect compile and publish technical and statistical data needed for achieving the goal (Sec 17).

Board shall have power to declare any area, automobile, industry having or causing air pollution (Sec 19) and restrict the industrial plant for its use (Sec 21). No person operating any industrial plant, in any air pollution control area shall discharge or cause or permit to be discharged the emission of any air pollutant excess of the standards laid down by the State Board (sec 22). State Board can make application to court for restraining person from causing air pollution.

Any person empowered by a State Board shall have a right to enter, at all reasonable times as he considers necessary, any place for seizing or examining and testing any control equipment, air sampling, industrial plant, record, register, document or any other material object or for conducting a search of any place in which he has reason to believe that an offence under this Act or the rules made thereunder (Sec 24). Board shall appoint analyst for the analysis of air sample and laboratories for the same purpose and preparation of report (sec 28-30).
If any person willfully delays or obstructs any person empowered by the State Board in the discharge of his duties, he shall be guilty of an offence under this Act (Sec 26).

Penalties

Whoever fails to comply with the provisions shall be punished with imprisonment for a term which shall not be less than one year and six months but which may extend to six years and with fine, and in case the failure to comply continues, an additional fine may be imposed which may extend to five thousand rupees for every day during which such failure continues after the conviction for the first such failure.

If the failure continues beyond a period of one year after the date of conviction, the offender shall be punished with imprisonment for a term which shall not be less than two years but which may extend to seven years and with fine.

Whoever contravenes any of the provisions of this Act or any order or direction issued thereunder, for which no penalty has been elsewhere provided in this Act, shall be punished with imprisonment for a term which may extend to three months or with fine which may extend to ten thousand rupees or with both, and in the case of continuing contravention, with an additional fine which may extend to five thousand rupees for every day during which such contravention continues after conviction for the first such contravention (Sec 31).

WATER (PREVENTION AND CONTROL OF POLLUTION) ACT, 1974

[Act No. 6 of Year 1974]

The Water (Prevention and Control of Pollution) Act is an Act to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water for the establishment, with a view of carrying out the purposes aforesaid, of Boards for the prevention and control of water pollution, for conferring on and assigning to such Boards powers and functions relating thereto and for matters connected therewith. Parliament takes power from the articles 249, 250, 252 of the Constitution to make laws for the States (Sec 1).
The Act defines (sec 2) following terms:

"pollution" means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms;

"sewage effluent" means effluent from any sewerage system or sewage disposal works and includes sullage from open drains;

"sewer" means any conduit pipe or channel, open or closed, carrying sewage or trade effluent;

"stream" includes river, water course (whether flowing or for the time being dry); inland water (whether natural or artificial); sub-terranean waters; sea or tidal waters;

"trade effluent" includes any liquid, gaseous or solid substance which is discharged from any premises used for carrying on any industry, operation or process, or treatment and disposal system], other than domestic sewage.

The Central Government shall constitute a Central Board to be called the Central Pollution Control Board (Sec 3) and state government shall constitute State Board (Sec 4) and in relation to a Union Territory, the Central Board shall exercise the powers and perform the functions of a State Board for that Union Territory. The board shall be constituted from various departments and representatives from various stakeholders. Board may constitute committees or give temporary association of persons for particular purposes (Secs 9-10).

Functions of Board (Sec 16-17)

- To promote cleanliness of streams and wells in different areas of the States;
- Advise the Government on any matter concerning the prevention and control of water pollution;
- Coordinate the activities of the Boards and resolve disputes among them;
- Provide technical assistance and guidance, carry out and sponsor investigations and research relating to problems of water pollution and prevention, control or abatement of water pollution;
- Plan and organize the training of persons;
- Organize through mass media a comprehensive program;
- Collect, compile and publish technical and statistical data relating to water pollution and prepare manuals, codes or guides relating to treatment and disposal of sewage and trade effluents and disseminate information connected therewith;
- Lay down, modify or annul, the standards for a stream or well;
- Plan and cause to be executed a nationwide /state level program;
- To inspect sewage or trade effluents, works and plants for the treatment of sewage and trade effluents and to review plans, specifications or other data relating to plants set up for the treatment of water, works for the purification thereof and the system for the disposal of sewage or trade effluents or in connection with the grant of any consent as required by this Act;

The Board may establish or recognize a laboratory and analyst to perform its functions efficiently (Sec 17). Under this Act government has power to restrict certain areas causing pollution, obtain information (Sec 20), take samples of effluents (sec 21), and obtain a report of results of analysis (Sec 22). For the same Board may empower any person, agency or institution to enter into for inspection, obtaining sample, etc. (Sec 23). The Act prohibits any person from taking or using poisonous, noxious or polluting water source unless specified for not human consumption (Sec 24). Board has power to restrict new outlets or new discharges into the water sources directly or indirectly (Sec 25) or existing discharge of sewage or trade effluent (Sec 26) or may refuse or withdraw permission (Sec 27).

Penalties

Whoever fails to comply with the direction on conviction, is punishable with imprisonment for a term which may extend to three months or with fine which may extend to ten thousand rupees or with both and in case the failure continues, with an additional fine which may extend to five thousand rupees for every day during which such failure continues after the conviction for the first such failure.

Whoever fails to comply with any order issued on conviction, is punishable with imprisonment for a term which shall not be less than one year and six months but which may extend to six years and with fine, and in case the failure continues, with an additional fine which may extend to five thousand rupees for everyday during which such failure continues after the conviction for the first such failure.

If the failure continues beyond a period of one year after the date of conviction, the offender shall, on conviction, is punishable with imprisonment for a term which shall not be less than two years but which may extend to seven years and with fine.

THE ATOMIC ENERGY ACT, 1962 AND SAFETY RELATED RULES

The Act provides protection and safety of workers and people dealing with radioactive material. For medical professionals dealing with X-rays and radioactive drugs, this Act provide protective measures. X-rays with their potential of causing cancers, genetic mutations and congenital malformations, have to be used judiciously and with utmost safety precautions to prevent harm to patients and others who may receive radiation during diagnostic procedures. The Atomic Energy Regulatory Board (AERB) has been constituted in 1983 to prescribe a safety code and regulations, ensure compliance, reviewing, training and research in the country. The AERB prescribe detailed safety for installation, supervision, monitoring and functioning of radiography, radiation surveillance procedures, and diagnostic X-rays units. Artificial radioactive isotopes e.g., Iodine 134 are used both for diagnosis and treatment. Waste generated during the procedure needs to be disposed off safely. Radioactive waste in nuclear medicine laboratory managed according to the guidelines provided by AERC. Used syringes and needles are kept in lead shielded bins for 10 half lives of specific radioactive material and radioactivity is measured by gamma radiography survey meter and when it indicates no emission then the waste is disposed off according to Biomedical Waste management & Handling Rules. Human urine and excreta is disposed off in Active Toilet, which is not used by other persons except patients. Doctors and staff must observed all possible precautions to prevent exposure from radiation and keep monitor the level of exposure lay down by AERB. Any new project need to get authorization from AERB. The annual occupational exposures were lowered gradually by stipulating a dose limit of 40 mSv for 1991, 35 mSv for 992 and 30 mSv for 1999 in order to meet the recommendation of International Commission for Radiological Protection (ICRP) -60. Lower dose of 20 mSv need to be investigated.

THE INSECTICIDES ACT, 1962 (AMENDED AS ON 2000) THE INSECTICIDES RULES, 1993

As a result of food poisoning arising from contamination of food with a poisonous organo-phosphorous insecticide, many persons died in the States of Kerala and Madras. The cases of food-poisoning due to tri-ortho-cresyl phosphate in wheat flour were also reported from West Bengal. Assam, Mumbai, Agra also reported poisoning cases from Benzene Hexachloride, Malathion, Diazinon, copper sulphate. In order to combat the menace of food poisoning due to insecticide, etc., the Insecticide Bill was passed 1968. The Act extends to whole of India.

The Act proposed two statutory bodies, namely the Central Insecticide Board (Advisory body) and the registration committee (implementing body) with the objectives of regulating import, manufacturing, sale, transport, distribution and use of insecticides with a view to prevent risk to human being, animals and other issues. The rules were framed in 1971 for better implementation. The Act prescribed the proper labeling of pesticides according to FAO guidelines and classification according to WHO.

No personal shall, import or manufacture misbranded insecticide (Sec17), sell, stock or exhibit for sale, distribute, transport, any insecticide without registration (Sec18). Government will appoint insecticide analysts, insecticide inspectors, for the purpose of this Act (Secs 19 & 20).

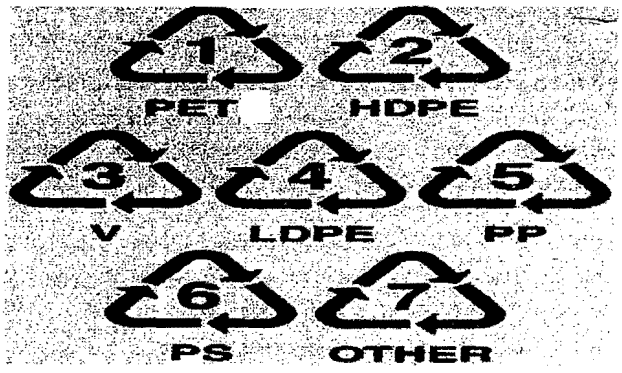
Packing of every insecticide shall include a leaflet containing details of:

a) the plant disease, insects, noxious animals or weeds for which insecticide is to be applied;
b) harmfulness to human being and animal including symptoms, adequate safety measures, emergency first aid, antidote for the poison, etc.

Labelling should be affixed in prominent place and warning statement should be readable clearly. The Color and warning statements are according to category of insecticides as follows:

Category	Color	Warning statement
1 Extremely Toxic	Bright Red	Poison Keep Out of the reach of children; If swallowed or if symptoms occur call physician immediately
2. Highly Toxic	Bright Yellow	Poison Keep out of the reach of children
3. Moderately Toxic	Bright Blue	Danger Keep out of the reach of children
4. Slightly Toxic	Bright Green	Caution

Medical Examination: All persons who are engaged in the work of handling, dealing or otherwise coming in contact with insecticides during the manufacture or formulation, spraying operation shall be medically examined before their employment (Pre-placement), and at least quarterly in the manufacturing and yearly in the other cases by a qualified doctor. When the insecticide is organophosphorus compound or a carbamate the blood cholinesterase level shall be measured at least once a month of all person working in manufacturing units and once in a year in the case of organo chlorine group. Any person showing symptoms of poisoning shall be immediately examined and given proper treatment. In all the poisoning, first-aid treatment shall be given before the physician is called (Rules 38). Persons shall be provided adequate protective clothing, which is washable, and impenetrable. For preventing inhalation of toxic dusts, vapor or gases the worker shall use respirators or gas masks suitable for the purpose, namely- chemical carbide respirator, supplied air respirator, demand flow type respirator, full face or half face gas masks with canister. Manufacturer shall keep sufficient quantities of antidotes and first aid medicine, and shall provide suitable training to the workers (Rules 39, 40, 41, 42).



PET-Polyethylene terephthalate, HDPE-high density polyethylene, V-Vinyl (PVC), LDPE-Low density Polyethylene, PP-Poly propylene, PS-Polystyrene, Other-All other resins and multimaterial like-Acryonitrile, butadiene styrene, PPO polyphenylene oxide, PC-polycarbonate, PBT-polybutylene terephthalate, etc.

Any contravention of this Act or Rules will be punished for a maximum of imprisonment for a term which may extend up to 3 years or with fine shall not be less than Rs. 15,000 but which may extend to 75,000 or with both.

Status of Pesticide risk

It is well known that the knowledge of appropriate pesticide handling and risk among agriculture workers is low which lead to unsafe practice and poisoning among agricutlure workers and general public (Carson 1969, Gupta 2004). There is a need of community awareness program regarding the risk and preventive methods which can be adopted.

PLASTIC WASTE (MANAGEMENT AND HANDLING) RULE 2011

This rule get power from Sec 3, 6 and 25 of Environment (Protection) Act 1986. Provision of rules 5 and 8 shall not apply to the manufecturers of Plastic bags exclusively for export purpose by export oriented manufecturing units. According to rules the Compostable plastics means that undergoes degradation by biological process during composting to CO2, water, inorganic compounds and biomass at a rate consistent with other known compostable material and does not visible, distinguishable or toxic residue. Plastic means material contains as an essential ingredient a high polymer and which at some stage in its processing into finished product can be shaped by flow. Virgin plastic means plastic material which has not been subjected to use earlier and has also not been blended with scrap or waste.

No person shall manufecture, stock, distribute or sell any carry bag made of virgin or recycled or compostable plastic which is less than 40 micron thickness.

Shachets using plastic shall not be used for storing, packaging or selling gutka, tobacco and panmasala. Recycling of plastic shall be carried out in accordance

with Indian Standard IS 14534: 1998 Guidelines. Manucipal authorities shall be responsible for selling up, operrationalization and coordination of waste management system used for performing the associated functions, namely 1) to ensure safe collection, storage, segregation, transportation, processing of disposable waste; 2) to ensure that no damage is caused to the environment; 3) to ensure setting up of collection units; 4) to ensure no open burning is happening; and 5) to create awareness among all stakeholders.

each carrying bag or multi-layer packaging should have name, registration number of manufecturer, thickness. each recycled carrying bag shall bear a label or a mark "recylced" as shown in figure. All persons who are manufecturing shall apply to State Pollution Control Board or Committees for registration which will be granted after verifying consents issued by Water and Air boards, and other requirements for environmentally safe business. Certificate shall be valid for 3 years. State shall have Advisory Body consists of secretary urban development as chairman, environment department, export from State pollution Control Board, Urban local body, NGO, industry and academic institutions. Voilation of any of the provision of this rule is punishable under the Environment (Protection) Act 1986.

E-WASTE (MANAGEMENT) RULE 2015

E-waste means waste electrical and electronic equipment whole or in part or rejects from their manufacturing, refurbishment and repair process which are intended to be discarded as waste. Electrical and electronic equipment which is dependent on electric currents or electro-magnetic fields to be fully functional.

'White –goods' means consumer electrical and electronics such as Television sets (including sets based on liquid crystal display and light emitting diode technology), Refrigerators, Washing machine, Air-conditioners excluding centralised air conditioning plants. Other items are freezers, audio systems, computers, and cell phones, Compact Fluorescent Lamp (CFL) and other mercury containing lamp waste. Electronic and electrical equipment means using electrincity or electromagnetic field for functioning. These waste are hazardous to enviuronment therefore they need to be dispose of by environmentally sound manner. In this all steps required to ensure that e-waste are managed in a manner which shall protect health and environment against any adverse effects, which may result from hazardous substance contained in such waste. The E-waste (management and Handling) Rules 2010 were enacted for this purpose which were amended in 2015 (Draft).

The producer, manufacturer, dealer, refurbisher or Producer Responsibility Organization (PRO) has responsibility to recycle or dispose of such waste in environmentally sound manner. Producer shall register the manufecturing unit, collecting, transporting and dismantling units with appropriate authority such as state pollution control board, or committee; shall inform the public for collection center, taking back from the consumer, packing in designated container and find the suitable place for dismantling of waste, labelling, recording etc. If the work is carried out by separate person for collection, dismantling and recycling then such person need to get registration. No one will store such waste more than 180 days. During the storage it should be safe to workers and environment.

Every producer of electrical and electronic equipment and their components shall ensure that, new electrical and electronic equipment and their component does not contain Lead, Mercury, Cadmium, Hexavalent Chromium, polybrominated biphenyls or polybrominated diphenyl ethers: Provided that a maximum concentration value of 0.1% by weight in homogenous materials for lead, mercury, hexavalent chromium, polybrominated biphenyls and polybrominated diphenyl ethers and of 0.01% by weight in homogenous materials for cadmium shall be permitted.

Department of Industry in State or any other government agency authorised in this regard by the State Government is to ensure earmarking or allocation of industrial space or shed for e-waste dismantling and recycling in the existing and upcoming industrial park, estate and industrial clusters.

Department of Labour in the State or any other government agency authorised in this regard by the State Government need to ensure recognition and registration of workers involved in dismantling and recycling; assist formation of groups of such workers to facilitate setting up dismantling facilities; undertake industrial skill development activities for the workers involved in dismantling and recycling; and undertake annual monitoring and to ensure safety & health of workers involved in dismantling and recycling.

Urban Local Bodies (Municipal Committee/Council/ Corporation) has been assign the duty to collect and channelized the orphan products to authorized dismantler or recycler. Every producer of electrical and electronic items shall ensure that, new equipments does not contain lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls or polybrominated diphenyl ethers. Its content should not exceed more than 0.01% of weight in case of cadmium a..d 0.1% in other metals.

DELHI MUNICIPAL CORPORATION ACT, 1957

This Act elaborates on various powers and functionaries of Delhi Municipal Corporation through various sections. This act has described in detail about sanitation and public health in its Chapter XVII. There is a provision for daily cleansing of streets and removal of rubbish and filth (Sec 350). Polluted and obnoxious matter from general public latrines, urinals and cesspools (Sec 355) which is the property of corporation (Sec 351), can be stored in receptacles, depots and places specified by the commissioner (Sec 352). It is the duty of owners and occupiers to collect and deposit rubbish, etc. from the premises in specified depots (Sec 353) and from factories and workshops (Sec 356). A written permission from the commissioner is must for the collection and deposit rubbish. No rubbish will be allowed for more than 24 hours other than receptacle approved by the commissioners (Sec 357). Construction of latrines, urinals for general public, markets, or private need to seek permission from commissioner in written. Commissioner has power to get it cleaned or scavenged if he feels so and can recover the expenses from the owner or occupiers (Sec 358).

Commissioner has the power to remove (Sec 365) or demolish (Sec 367) any congested building unfit for human habitation or may give notice to get it improved (Sec 366). The building should be inspected on the following matters: 1) need repair, 2) stability, 3) freedom from dump, 4) natural light and air, 5) water supply, 6) drainage and sanitary conveniences, and 7) facilities for storage, preparation and cooking of food and for the disposal of rubbish, filth and other polluted matter. No washerman would wash clothes on any other place, except the place specified by the commissioner (Sec 370).

Medical practitioners have to inform Municipal Health Officer about the person whom he/she is treating and known to possess any dangerous disease which may cause suffering to the public or other individuals (Sec 371). Commissioner or any other authorized person may remove such person suffering from dangerous disease to the infectious disease hospital or specified hospitals. They have power to disinfect building and articles (Sec 372) or destroy infectious huts and shed (Sec 374). It is the duty of such infected person not to risk other healthy individual (s).

In case of epidemic of dangerous disease the commissioner can give public notice to control and person breaching such direction may be liable for punishment under Indian Penal Code Sec 188. No person shall without previous disinfection of the infected article give, lend, sell, transmit otherwise dispose of to another person and no infected person shall make, carry or offer for sale or take any part in making of food, or drink or any medicine or drug or cloth, bedding for human consumption or use (Sec 382). Commissioner has power to restrict or prohibit sale of food or drink in any epidemic or outbreak or in threatened conditions (sec 383).

In case of birth of a child the parent(s) shall inform chief registrar appointed for this purpose within 21 days after such birth. Similarly the death shall be registered on the information provided by any nearest relative who is aware of the cause of death. If the death or birth has occurred in hospital, it is the duty of medical officer in charge of the hospital within 24 hours to send the information (Sec 394-396). No person shall cause nuisances like disposing, storing rubbish, filth, polluted matter, or cowdung, nightsoil, open defecating, burning corpse, beating drum, singing, screaming or

shouting, using amplifier, using loudspeakers, letting loose any animal that can cause injury, or not preventing the child (<12yrs) to ease himself in any public street or public place (Sec 397). Dog registration can be done under the Section 399. Licence for running eating place, hawking article, theater, circus, public amusement etc. are also mandatary under this Act. Contravenes of any provision of any sections or clauses shall be punishable with fine and imprisonment according to the table-the Twelfth scheduled (extending Rs. 50 to Rs.10,000 and imprisonment extend to 3 years).

THE MOTOR VEHICLES ACT, 1988

Motor vehicles are important causes of not only air and noise pollution but also cause road traffic injuries including death. There is an injury every second minute and fatality on road every ninth minute in India, i.e., 156 people die every day. Injury is seventh leading causes of death. Road traffic accidents are third leading cause of death in age group of 15-44 years. This Act is to consolidate and amend the law relating to motor vehicles. It extends to the whole of India.

This Act regulate all aspects of motor vehicles. Section 2 defines many terms related to types of vehicles, manufacturing, ownerships, registration, dealership, transport related, driver licensing both learning and permanent, etc. No person under the age of 18 years shall drive and no person shall drive a motor vehicle in any public place unless he holds an effective driving license issued by authorizing person (Sec 3, 4). School buses and other vehicles should bear the clear instructions about what they carry, and precautions to be taken. The penalties are given for every violation of restrictions or activities prohibited in the Act such as over speeding, bad maintenance, without light in night, driving under influence of alcohol, heavy loading, wrong timing, wrong parking, mentally and physically unfit to drive etc.

COMMENTS

Unfortunately, the Act do not emphasize on injury prevention awareness programs. People follow the traffic rules just because of fear of punishment. Their attitude for leading a healthy and preventive life style is not increasing. There is wide level corruption which hinder proper implementation of the Act. Enforcement personnel of the Act are the one who violate it maximum so they can not be the role model for learning traffic principles. Their awareness level about the Act is also lacking. Their rude attitude to the public is another hindering factor for adequate their full participation.

THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000

Increasing ambient noise levels in public places from various sources, inter-alia, industrial activity, construction activity, generator sets, loud speakers, public address systems, music systems, vehicular horns and other mechanical devices have deletorious effects on human health and the psychological well being of the people. It is considered necessary to regulate and control noise producing and generating sources with the objective of maintaining of ambeint air quality standards in respect of noise. As it is known that human can tolerate upto 85 dB for few hours and can have auditory fatigue at 90dB and hearing loss at 100dB. There are following nonhearing effects of noise: 1) interference with speech; 2) annoyance; 3) decrease efficiency of work; 4) physiological changes in blood pressure, nerve conduction, etc; and 5) economic losses due to decrease in work efficiency and sickness produced by noise.

The Ministry of Environment and Forest Government of India has notified these rules under Environment (Protection) Act 1986. The authority is given to District Magistrate, Police Commissioner, or any other officer not below the rank of Deputy Superintendent of Police for the maintenance of the ambient air quality standard in respect of noise.

The state government shall take measures for abatement of noise including noise emanting from vehicular movements and ensure that the existing levels do not exceed the ambient air quality standards. Area comprising not less than 100 meters around hospitals, educational institutions and courts may be declared as silence area/zone.

A loud speaker or a public address system shall not be used except after obtaining written permission from

the authority. A loud speaker or a public addressing system shall not be used at night (between 10pm to 6am) except in closed rooms, community halls and banquet halls. Government may permit use of loud speaker or public addressing systems, during night hours (between 10pm to 12 midnight) on or during any cultural or religious festive occasion of a limited duration not exceeding fifteen days in all during a calender year.

Any person who violate the terms and consitions of rules i.e., noise exceed more than 10 dB from the prescribed limit shall be liable for penalty according to Envrionment (Protection) Act 1986.

References

Bhoyar RV, Titus SK, Bhide AD, Khanna P. Municipal and industrial solid waste management in India. J IAEM 1996; 23:53-64.

Central Pollution Control Board. Environmental Standards and Guidelines for the Management of Hospital Waste. CPCB, ME&F Delhi, New Delhi, June 1996.

Chamber land ME, Ciesielski A, Howard RJ et al. Occupational Risk of infection with Human Immunodeficiency virus. Surg Clin North Am 1995; 75 (6): 1057-1070.

Carson R. Slient Spring. 4th Ed London: Hamish Hamilton 1969.

Consumer Education and Research Center. Pesticides Residues in Food-report of a workshop, Ahmedabad 1989.

Delhi Municipal Corporation Act 1957. Akalank Publications Delhi: Morigate

Gazatte of India. The Motor Vehicles Act 1988 [59 of 1988], Government of India.

Gazette of India. Public Liability Insurance Act, 1991 [Act No. 6 of Year 1991]. Government of India.

Govt. of India. The Insecticides Act, 1968 (46 of 1968).

Govt. of India. The Insecticide Rules 1971.

Gazette of India. The Environment (Protection) Act No. 29 of Year 1986] [GSR 1198(E), dated 12th. November, 1986].

Gazette of India. Hazardous Waste (Management & Handling) Rules 1989. Govt of India.

Gazettee of India. Plastic Waste (Management and Handling) Rule 2011. Ministry of Environment and Forest Govt. of India 4 Feb 2011.

Govt. of India. Biomedical Waste (Management & Handling) Rules, 1998, Extraordinary, Part II, Section 3, Subsection (ii), The Gazette of India, No. 460, 27 July 1998.

Govt. of India. Hazardous Wastes (Management and Handling) Rules, 1989. Ministry of Environment & Forests, Govt. of India, New Delhi

Govt. of India. Municipal Solid Wastes (Management and Handling) Rules, 2000. Ministry of Environment and Forests, Govt. of India, New Delhi.

Govt. of India. The Environment (Protection) Act, 1986 No. 29 OF 1986 [23rd May, 1986]. Ministry of Environment & Forest, Govt. of India.

Govt. of India. Municipal Solid Waste (Management & Handling) Rules 2000. The Gazatte of India, SO 908 (E) II 3 (ii) Extra Sl648.

Gupta P. Pesticide exposure-Indian scene. J Toxicology 2004; 198 (1): 83-90.

Jahnavi G et al. Awareness and training need of biomedical waste management among undergraduate students, Andhra Pradesh. Ind J Public health 2006; 50 (1): 53-54.

Joardar GK, et al. Needle Sticks injury among nurses involved in patient care: a study in two medical college hospitals of West bengal. India J Public Health 2008; 52 (3): 150-152.

Kermode M, Jilley D, et al. Occupational exposure to blood and risk of bloodborne virus infection among health care workers in rural north indian health settings. Am J Infect Control 2005; 33: 34-41.

Khuri Bulos NA, Tonkan A, Mahafzah A, Al-Adham M, Faori I, Abu-Khedar I, Abu-Rumeileh ZI. Epidemiology of Needle Stick and Sharp Injuries at a University Hospital in a Developing Country: a 3 years Prospective Study at a Jordan University Hospital, 1993 through 1995. Am J Infect Control 1997; 23 (4): 322-9.

Kishore J, Goal P, Sagar B, Joshi TK. Awareness about Biomedical Waste Management and Infection Control among Dentists of a Teaching Hospital in New Delhi, India. Indian J Dent Res 2000; 11 (4): 157-61.

Kishore J, Ingle GK, M Mehra. Knowledge About Environmental Health Among Medical Professionals in Delhi. Paper Presented in 46th Annual Conference of Indian Public Health Association (IPHA) in Kolkata, West Bengal; 25th to 27th January 2002.

Kishore J. A Dictionary of Public Health. 46 Masih Garh New Delhi: Century Publications 2007.

Kishore J. Biomedical Waste Management of India. 46 Masih Garh New Delhi: Century Publications 2004.

Lahiri T, Ray MR. Health effects of chronic exposures to Municipal Solid Waste in India. Proceeding of National Conference on Solid and Hazardous Waste Management Problems and Solutions. New Delhi: IDC 2007

Makary MA 2007 et al. Needlestick injuries among surgeon in training. NEJM 2007; 356: 2693-9

Monika, Kishore J. E Waste: A Challenge to Public Health. Ind J Com Medicine 2010.

Newsletter of Atomic Energy Regulatory Board 1998; 11 (2). 1-8.

Pandit NB, Mehta HK, Kartha GP, Chaudhary SK. Management of biomedical waste: awareness and practices in a district of Gujarat. Ind J Pub Health 2005; 49 (4): 245-247.

Patil AD, Shekdar AV. Health-Care Waste Management in India. J Environ Manage 2001; 63 (2): 211-20

Pinto VN. E-waste hazard: The impending challenges. IJOEH 2008; 12 (2) 65-70.

Sharma R, Rasania SK, Verma A, Singh S. Study of prevalence and response to needle stick injuries among health care workers in a tertiary care hospital in Delhi, India.

Singru SA, et al. Occupational exposure to blood and body fluid among health care workers in a teaching hospital in Mumbai, India. Ind J Comm Med 2008; 33: 26-30.

Wagner KD. Defining and characterizing the waste stream of health care facilities. In. Wagner KD. Environment Management in Health Care Facilities. Philadelphia, 1998, WB Saunders Company.

Ministry of Environment and Forest. "Chemical Disaster Prevention Day." The Hindustan Times 4th December 2001

Tiwari HN. Environmental Law. Allahbad Law Agency. Faridabad, Haryana 1997.

The Times of India. New Delhi 7th May 1997.

The Gazette of India. The National Environment Tribunal Act, 1995 [Act No. 27 of 1995]. Government of India.

CHAPTER 76

DISASTER MANAGEMENT ACT 2005

Disaster Management Act is to provide statutory structure and functions for the effective management of disasters and related issues. The Act is applicable to whole of India. In Chapter 1 Disaster is defined as "a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and destruction of, property, or damage to, or degradation of, environment, and is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area". Disaster management means a continuous and integrated process of planning, organizing, coordinating and implementing measures which are necessary or expedient for-

i) prevention of danger or threat of any disaster;
ii) mitigation or reduction of risk of any disaster or its severity or consequences;
iii) capacity-building;
iv) preparedness to deal with any disaster;
v) prompt response to any threatening disaster situation or disaster;
vi) assessing the severity or magnitude of effects of any disaster;
vii) evacuation, rescue and relief;
viii) rehabilitation and reconstruction;

Mitigation means measures aimed at reducing the risk, impact or effects of a disaster or threatening disaster situation. Preparedness" means the state of readiness to deal with a threatening disaster situation or disaster and the effects thereof.

According to CHAPTER II, a National Disaster Management Authority should be established for the purposes of this Act that shall consists of the Chairperson and 9 members as may be prescribed by the Central Government :

a) the Prime Minister of India, who shall be the Chairperson of the National Authority, ex officio;
b) other members, not exceeding nine, to be nominated by the Chairperson of the National Authority.

On the same pattern state level and district level authority shall be constituted. National Authority shall have the responsibility for laying down the policies, plans and guidelines for disaster management for ensuring timely and effective response to disaster. It shall recommend provision of funds for the purpose of mitigation

The National Authority may constitute an advisory committee consisting of experts in the field of disaster management and having practical experience of disaster management at the national, State or district level to make recommendations on different aspects of disaster management.

The Central Government shall constitute a National Executive Committee to assist the National Authority in the performance of its functions under this Act.

The National Executive Committee shall consist of the following members, namely:-

a) the Secretary to the Government of India in charge of the Ministry or Department of the Central Government having administrative control of the disaster management, who shall be Chairperson, ex officio;
b) the Secretaries to the Government of India in the Ministries or Departments having administrative control of the agriculture, atomic energy, defence, drinking water supply, environment and forests, finance (expenditure), health, power, rural development, science and technology, space, telecommunication, urban development, water resources and the Chief of the Integrated Defence Staff of the Chiefs of Staff Committee, ex officio.

The National Executive Committee may, as and when it considers necessary, constitute one or more subcommittees, for the efficient discharge of its functions.

National Executive Committee shall assist the National Authority in the discharge of its functions and have the responsibility for implementing the policies and plans of the National Authority and ensure the compliance. It shall provide necessary technical assistance to the State Governments and the State Authorities for preparing their disaster management plans and monitor and evaluate the implementation.

National Plan shall be prepared by the National Executive Committee and in consultation with the State Governments and expert bodies or organizations in the field of disaster management that would be approved by the National Authority. It shall be reviewed and updated annually. It shall include following:

a) measures to be taken for the prevention of disasters, or the mitigation of their effects;
b) measures to be taken for the integration of mitigation measures in the development plans;
c) measures to be taken for preparedness and capacity building to effectively respond to any threatening disaster situations or disaster;
d) roles and responsibilities of different Ministries or Departments of the Government of India.

Government of India and such Ministries or Departments shall draw up their own plans in accordance with the National Plan.

The National Authority may, in cases of disasters of severe magnitude, recommend relief in repayment of loans or for grant of fresh loans to the persons affected by disaster on such concessional terms as may be appropriate. Guidelines for minimum standard of relief have been specified by the Act.

In Chapter V what measures the central, state and district government shall take is described. Responsibilities of Ministries or Departments of Government of India are also fixed for preparedness, integration, responding to disasters, review of situation and allocation of funds.

In Chapter VII National Disaster response force has been constituted for the purpose of specialist response to a threatening disaster situation or disaster.

In Chapter IX Finance, account and audit matters are described. National Disaster Response Fund has been constituted for meeting any threatening disaster situation or disaster. On similar pattern state and district level funds has been established.

In chapter V offence and penalties are described. Whoever, without reasonable cause- a) obstructs any officer or employee of the Central Government or the State Government, or a person authorized by the National Authority or State Authority or District Authority in the discharge of his functions; or (b) refuses to comply with any direction given by or on behalf of the Central or State Government or the Executive Committees shall on conviction be punishable with imprisonment for a term which may extend to one year or with fine, or with both, and if such obstruction or refusal to comply with directions results in loss of lives or imminent danger thereof, shall on conviction be punishable with imprisonment for a term which may extend to two years. Person whoever male false Claim shall be punished with imprisonment for a term which may extend to two years, and also with fine. Penalties of officers, companies, and bodies are also described.

CHAPTER 77

THE RED CROSS SOCIETY (ALLOCATION OF PROPERTY) ACT, 1936

The Indian Red Cross Society Act 1920, previously administered by Burma (now Myanmar) had terminated and funds were transferred to the Red Cross Society under this Act. Purpose of this society was to collect money, gift from public for the purpose of medical and other aid to sick, wounded, war victims, etc. Society has 25-30 members and among these members 10-30 members form a managing body. Whole management is rested on this managing body that regulates, monitors finances, and issues memberships, and inclusion of foreign representatives, etc. The Act defines when and who could be benefited from the society and what percentage will go to the states and union territories.

The Indian Red Cross's programs are grouped into four main core areas: promoting humanitarian principles and values; disaster response; disaster preparedness; and health and care in the community.

These activities are being carried out by most Red Cross and Red Crescent Societies. Red Cross is promotes the **humanitarian values**, which encourage respect for other human beings and a willingness to work together to find solutions to problems. From the seven fundamental principles, the movement aims to influence the behavior of all the people.

Disaster response continues to represent the largest portion of their work, with assistance to millions people annually ranging from refugees to victims of natural disasters. This section includes their emergency response units and issues relating to humanitarian policies as we strive to improve the quality of their immediate response and long-term rehabilitation work, who come in contact with it.

The sharp increase in the number of natural disasters countrywide in recent years has prompted the Red Cross to devote more attention to **disaster preparedness** activities. These aim to make Red Cross Societies and communities more aware of the risks they face, how to reduce their vulnerability, and how to cope when disaster strikes.

Too many people die as a result of no access to even the most basic health services and elementary health education. **Health and community care** has become a cornerstone of humanitarian assistance, and accounts for a large part of Red Cross spending. Through these programs, the Red Cross aims to enable communities to reduce their vulnerability to disease, and prepare for and respond to public health crises. **Capacity building** programs include management and volunteer training, improving branch structures, planning, fund-raising and gender equality.

CHAPTER 78

INTERNATIONAL HEALTH REGULATION

The International Health Regulations (IHR) were first adopted by the World Health Assembly in 1969 in an attempt to ensure maximum security against the international spread of disease with minimum interference with world traffic. As of 1997, the IHR were legally binding on all WHO's Member states except Australia. The IHR are a set of regulations for the control of sharing of epidemiological information on the transboundary spread of cholera, plague, and yellow fever; To achieve this, the regulation provide for binding obligations on WHO Member states to notify WHO of any outbreaks of these three diseases in their territories. As assessment of the effectiveness of the IHR reveals that WHO Member states have not observed regulations because of the fear of excessive measures from other countries if a country that has suffered an outbreak of any of the three diseases notifies this fact to WHO. Also fear of huge loss of economy for the notifying country after notification. However, all three diseases are treatable however, there are new diseases emerging out which require more attention. So the IHR should be flexible to accommodate new development.

So, the regulation is being revised in 1995 so that they are adopted to the present volume of international traffic and trade, and so that they take into account the current trends in the epidemiology of communicable diseases including emerging disease threats.

In order to expedite notification, disease outbreaks will be characterized initially by clinical syndromes rather than specific diagnoses. Under the revised international regulations, the routine occurrence of endemic diseases will not be notifiable. The syndromes proposed for notification are acute hemorrhagic fevers, acute respiratory syndrome, diarrheal syndrome, jaundice and neurological syndromes, and a category covering other notifiable syndromes of presumed infectious origin which could be emerging or reemerging disease. Notification of a syndrome will normally be followed by a report on the specific disease once the diagnosis has been established. If the diagnosis is already known, the disease can be notified rather than the corresponding syndrome. The revised IHR will not supersede or interfere with national or international surveillance efforts (WHO-SEARO 1999).

The IHR list maximum public health measures applicable during outbreaks and provide for rules applicable to international traffic and travel. These measures cover the requirements of health and vaccination certificates for travelers from areas infected by the three diseases covered to noninfected areas; derating, disinfecting, and disinsecting of ships and aircraft, as well as detailed health measures at airports and seaports in the territories of WHO Member States.

International health law, which encompasses human rights, food safety, international trade law, environmental law, war and weapons, human reproduction, organ transplantation, as well as a wide range of biological, economical, and sociocultural determinants of health, now constitutes a core component of global communicable disease architecture. Since WHO, has no multinational army to enforce sanctions on erring Member States, especially the powerful ones, the implementation of regulation usually fail to occur. However, it is also observed that threat is not the only reason to comply but country should adopt an international law in the best interest of the world. The legitimacy of global health governance will be boosted significantly if states begin to feel that by following international health rules/ regulations they will be protecting their own populations from communicable disease threats.

Reference

Aginam O. International Law and Communicable diseases. Bull of WHO 2002; 80 (12): 946-951.

WHO-SEARO. Health Situation in the South-East Asia Region (1994-1997). WHO-SEARO New Delhi 1999

CHAPTER 79

NATIONAL AND INTERNATIONAL HEALTH ORGANIZATIONS

Health Organizations

Since times immemorial, human society has been divided into groups that keep fighting with each other for their interests. If two parties to a conflict are unable to come up to an amicable solution, it is not unusual for a third party to intervene through negotiations, conferences, and treaties. As civilization progressed the methods of reaching to the solutions also became more sophisticated and needed organized efforts. Organization of people was also required in older times, for hunting of animals, for agriculture work, and to win the war. Similarly, the famines and epidemics could not be controlled by the individual efforts and required joint efforts of rulers and people in an organized manner.

Organization is the act or process of organizing; the state or manner of being organized. An organization is a group of persons organized for a particular purpose. It is a body of two or more people (or parts) engaged in the pursuit of common goals. It is a consciously coordinated social entity, with a relatively identifiable boundary, that functions on a relatively continuous basis to achieve a common goal or set of goals. An organization has an internal structure that includes a communication network, patterns for making decisions, reward systems, and norms governing behavior. All organizations also have organizational climate: attitudes and values of the individuals that comprise the organization, and the expectation of the organization as reflected in morale, working styles, degrees of competition, cooperation and risk-taking. Organizations also have external environment that significantly influence their character and it is with this environment that the organization must interact to achieve its purposes. An environment of an organization includes the community, health care system, government policies, regulatory agencies, and sectors of government, competitive groups, patients or other types of clientele, economic conditions, political and social circumstances, and cultural norms. They all are part of organizational universe (Kishore 2007).

Organization needs to be differentiated from conference and treaties. Conference is a meeting for consultation or discussion or exchange of views. It is a meeting of committees to settle differences between two legislative bodies. Treaties are formal agreements between two or more states, as in reference to terms of peace or trade. This is a document of contract or agreement in which such an agreement is set down. A treaty may be bilateral or multilateral. A treaty ordinarily deals with the rights and duties of nations, but treaties may also grant specific rights to private individuals. Treaties may deal with a great variety of subjects such as drug patent, medical technologies, etc.

When we talk of health of people then first of all we must realize that various factors such as political, social, economical, and international relations have a

bearing on community health. Due to international disharmony, community health can be affected because resources available in one country may not be available to another country. As almost all health problems are preventable, and with the help of community participation the community health can be achieved, it is pertinent to understand the intricacies of organized efforts. One has to learn about various aspects of organizations so that further improvement can be brought.

Organizations can be classified according to membership such as multilateral, global, regional, international, bilateral, governmental and nongovernmental organization (NGO). *Multi-lateral organizations* are organizations formed between three or more nations to work on issues that relate to all the countries in the organization. These are global or regional or international organizations, Middle East /Africa organizations, American and Asian organizations. Some of the examples are Organization for Economic Cooperation and Development (OECD), Greenpeace International, European Union, Arab Bank for Economic Development in Africa, SAARC (South Asian Association for Regional Cooperation). *Bilateral organizations* are governmental agencies in a single country which provide aid to developing countries. The largest of these are the United States Agency for International Development (USAID) and Department of International Development (DFID). Political and historical reasons often determine which countries receive donations from bilateral agencies and how much they receive. For example, France concentrates on its former colonies, and Japan gives mostly to developing countries in Asia.

Globalization and Public Health

There is growing concern about the effects of globalization on public health. Both, positive and negative viewpoints are prevalent. But recently, it has been highlighted that health of poor people in developing countries is being adversely affected due to globalization. When we talk about globalization in India then discussion about different states, religion and caste can not be ignored.

Globalization has always existed, in one form or another. It is only in the past 50 years or so that it has become a major force controlling not only the economic spheres but also health, agricultural, political, social and cultural ones. Globalization is the dynamic process of flow of information, goods, capital and people across political and geographic boundaries. New globalization process is an attempt to create new rules and regulations for free trade of goods, capital, and services and to enforce and monitor this new agenda through new international instruments such as World Trade Organization (WTO), International Monetary Fund (IMF), and the World Bank. It involves removal of the restrictions imposed by the countries or states and promotes private economy based on private market, i.e., withdrawal of State or minimum role of the state in governance of the economy and society which required *structural adjustment*. It is believed that by doing this there will be improvement in economic growth and prosperity of people. *Structural Adjustment* is an economic adjustment. Usually synonymous with a stabilization program, the term may be used to debate the set of measures aimed at achieving the longer term objective of such a program-accelerating economic growth mainly by structuring the economic and reducing excessive or inefficient government intervention.

There are many eminent scholars who have stated the adverse effects of globalization. But it is incorrect to say that everybody is going to lose by globalization. Who are the gainers of globalization? These are rich countries, rich people, and highly skilled professional who are the main gainers of globalization. Loser are poor states, poor people and in India they are all downtrodden, women, and children. The *Human Development Report 1997* stated that while the rich are improving their lot through globalization, the poor are worse off. The gap between poor and rich has increased many times during the last century. Multinational companies (MNCs) are gaining more and more control over world production and trade. It is known that 90% of the resources are utilized by 10% of the population. The World Health Organization stated that there is growing global burden of Non-Communicable Diseases such as cardiovascular and mental diseases in poor countries and poor populations where it is neglected by policy-makers, major multilateral and donor agencies and academics. WHO blames urbanization and modernization, overcrowding and hunger, for the sharp increases in the incidence of psychosomatic diseases, depression, dementia,

anxiety, chronic stress, violence, alcoholism, schizophrenia and suicide. There is a definite increase in psychosomatic problems like ulcers, psoriasis, hypertension, and bronchial asthma.

An availability of treatment options including drugs and vaccines is mainly controlled by MNCs and further trying to capture the basic human rights of health by patent legislation. Because of these selfish interests, even indigenous or traditional medicinal knowledge is patented and controlled by MNCs, who refuse to reduce prices for example, of HIV drugs to help millions dying of AIDS. Health is not merely an absence of disease but it is a state of physical, mental and social well-being. It is affected by many factors such as drug abuse, poor environmental conditions of house and surroundings, human right violation, poor socioeconomic status, poor literacy, etc. Majority of poor for example, has tuberculosis because they do not have enough to eat beside other bacterial and environmental reasons. Malnutrition decreases the immunity that leads to increase vulnerability for infections. A malnourished poor or downtrodden and vulnerable group falls pray of tuberculosis subsequently.

Globalization needs to be realized for the benefit of all sections of society. Its beneficial effect should reach to a common man and should able to alleviate overall poverty. This is partly possible by the activism of various national and international organizations because they have influence over people across the religion and geographical boundaries. A public health expert and social health activist must understand the working of these organizations.

National and International organizations have a significant influence over national programs, policies and legislations. For example WHO & UNICEF Joint declaration on primary health care at Alma Ata that led to formulation of National Health Policy 1983, Equal Remuneration Act of 1978 was enacted after the ILO Convention of 1951 and Child Labor (Prohibition and Regulation) Act 1986 after the ILO convention of 1993.

International Organizations

International organization is defined as the aggregate of procedures and organs for expressing the unification of nations. It qualifies any degree of international unity or community superseding national interest, policy or action to satisfy the concept. Their purpose is to foster international cooperation in areas such as security, law, economic and social matters and diplomacy. The United Nations has defined international organization as the process and body in which states establish and develop formal, continuing institutional structures for the conduct of certain aspects of their relationships with each other, e.g., United Nations, World Health Organization, South Asian Association for Regional Cooperation (SAARC), etc.

Modern international organizations can be classified into two main types: the public organizations, also known as intergovernmental organizations (IGOs), for example the WHO; and the private organizations which are referred to as international non-governmental organizations (INGOs), such as Amnesty International, the International Red Cross, CARE, DFID, etc. International Organizations may be classified on the basis of their powers. These can be legislative, administrative and judicial. There are general or multiple purpose organizations, such as United Nations. At the regional and inter-regional levels there are organizations such as the European Union, SAARC (South Asian Association for Regional Cooperation), Organization of American State (OAS), and Organization of Islamic Conference (OIC). The much larger group of limited purpose organizations is concerned with specific areas, e.g., at the global level are the International Labor Organization (ILO) and FAO (Food and Agriculture Organization); more limited in membership are NATO (North Atlantic Treaty Organization) and the African Groundnut Council.

Role of International organizations

- Strategic: *Recognizing the toll of diseases, convincing the govt.*
- Facilitation: *Provide tech. assistance, advice & tools*
- Resource mobilization: *Supporting implementations & promoting research*
- Advocacy: *Accepting ownership & promoting engagement*
- Implementation: *Policy development & ensuring programs on ground*
- Communication: *Assessing interventions & programs to support research*

International intergovernmental organizations are formal institutional structures that function across national borders and come into existence through multilateral agreement. IGOs are established by formal agreement between states (that is, treaties) and states retain ultimate authority over these organizations.

In a world faced with increasingly complex global problems international organizations provide important channels of communication and mechanisms for engendering international cooperation and action on a multiplicity of issues and fronts (Evan 1998).

International Law is the body of rules binding on states and international organizations (Aust 2000). In an era of globalization the structures of governance are changing (Basedow 2000), in order to maintain a hold on the economic and social conditions in their respective countries, states will try to enact supranational regulations (either at the global or regional level). Therefore, the role of international law in regulating a globalized world is becoming more prominent. The relevance of international conventions to public health, such as the proposed Framework Convention on Tobacco Control, and rules formulated by international organizations such as WHO's International Health Regulations, are important examples. Norms of customary international law, for example the customary duty to notify other states of infectious disease outbreaks, are also relevant to international public health in a rapidly changing world (Bettcher 2002, Fidler 1999).

International Regime refers to the convergence and acceptance among a group of states of mutual expectations, rules and regulations, organizational plans, energies, and financial commitments (Ruggie 1998). For instance, in the sphere of global public health, the mutual expectations of the Member States of the WHO have recently converged around the idea of negotiating rules and regulations, in the form of a Framework Convention on Tobacco Control. These mutual expectations and future global rules and regulations for tobacco control constitute a new international regime. Regime theorists in international relations believe that humankind's survival depends on our capacity to mutually regulate global activities by means of international regimes (Bettcher 2002, Little 1997).

International Government Organizations

United Nations came into being with the adoption of the Charter of the United Nations at the San Francisco Conference in 1945. Building on the experience, but at the same time trying to correct the problems, of the League Nations from the inter-wars period, the founders of UN were determined to create a new intergovernmental organization to ensure peace and to create the economic, social and political underpinnings by which these goals could be achieved (Evan 1998, Taylor 1997). It has built on the twin tenets of state sovereignty and collective security (Jenks 1969). Reflecting the central concern of the United Nations system, namely security, one of the main pillars of the central system is the Security Council.

Another central organ of the UN is the General Assembly, a world assembly of representatives of all of the members, which functions as a world forum. The central system also consists of the Secretariat, headed by the Secretary General, and the Economic and Social Council (ECOSOC). The General Assembly alongside the Secretariat and ECOSOC are responsible for overseeing the activities of other institutions which comprise the United Nations system; in addition to the central system, the UN system is comprises of two types of institutions, Specialized Agencies (for example, WHO) and Funds and Programs (for example, United Nations Development Program and the World Food Program). The new global challenges of the post-Cold War era, and the emergence of New Agenda problems, including environmental degradation, HIV/AIDS, international terrorism, and refugees, has stimulated the need for major UN global conferences, for example focusing on the environment in Rio in 1992 and 2007 and on population in Cairo in 1994 (Taylor 1995). Recent analyses have argued for enhanced multisectoral collaboration across the UN system to address globalized public health problems (Bettcher 1997), and have emphasized the important part that intergovernmental organizations, such as the UN, can play in the provision of global public goods, including those to improve public health (Kaul 1999). There are at least five UN organizations with substantial involvement in global health activities, leading to considerable confusion over their distinct and appropriate mandates. The identification of each organization's comparative advantage, from the local

to the global level, is one way of understanding what each organization does best and perhaps should be doing. (Bettcher 2002, Lee 1996)

World Health Organization (WHO): is an intergovernmental organization within the United Nations System. When diplomats met to form the United Nations in 1945, one of the things they discussed was setting up a global health organization. WHO's Constitution came into force on 7 April 1948 – a date now celebrate every year as World Health Day.

Objectives and functioning: WHO's objective, as set out in its Constitution, is the attainment by all peoples of the highest possible level of health. The Constitution defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. The WHO has two main constitutional functions: 1) to act as the directing and coordinating authority on international health work; and 2) to encourage technical cooperation for health with Member States. The WHO performs its functions through three principle bodies-the World Health Assembly, the Executive Board and the Secretariat. The World Health Assembly is the supreme decision-making body for WHO. It meets each year in May in Geneva, and is attended by delegations from all 193 Member States. The Executive Board is composed of 34 members technically qualified in the field of health. Members are elected for three-year terms. The main Board meeting, at which the agenda for the forthcoming Health Assembly is agreed upon and resolutions are adopted for forwarding to the Health Assembly, is held in January, with a second shorter meeting in May, immediately after the Health Assembly, for more administrative matters.

More than 8000 people from more than 150 countries work for the Organization in 147 country offices. In addition to medical doctors, public health specialists, scientists and epidemiologists, WHO staff include people trained to manage administrative, financial, and information systems, as well as experts in the fields of health statistics, economics and emergency relief. The WHO headquarters are located in Geneva, Switzerland. A characteristic feature of WHO is its decentralization. There are six regions, each of which has its own regional committee and regional offices: 1) South East Asia-Head Quarter (HQ) New Delhi, (2) Africa-HQ Brazzaville, (3) The Americas-HQ Washington DC, (4) Europe-HQ Copenhagen, (5) Eastern Mediterranean-HQ Alexandria, and (6) Western Pacific-HQ Manila (WHO 1990).

WHO Agenda: WHO operates in an increasingly complex and rapidly changing landscape. The boundaries of public health action have become blurred, extending into other sectors that influence health opportunities and outcomes. WHO responds to these challenges using a six-point agenda.

1. *Promoting development:* During the past decade, health has achieved unprecedented prominence as a key driver of socioeconomic progress, and more resources than ever are being invested in health. Yet poverty continues to contribute to poor health, and poor health anchors large populations in poverty. Health development is directed by the ethical principle of equity: Access to life-saving or health-promoting interventions should not be denied for unfair reasons, including those with economic or social roots. Commitment to this principle ensures that WHO activities aimed at health development give priority to health outcomes in poor, disadvantaged or vulnerable groups. Attainments of the health-related Millennium Development Goals, preventing and treating chronic diseases, and addressing the neglected tropical diseases are the cornerstones of the health and development agenda.
2. *Fostering health security:* Shared vulnerability to health security threats demands collective action. One of the greatest threats to international health security arises from outbreaks of emerging and epidemic-prone diseases. Such outbreaks are occurring in increasing numbers, fuelled by such factors as rapid urbanization, environmental mismanagement, the way food is produced and traded, and the way antibiotics are used and misused. The world's ability to defend itself collectively against outbreaks will be strengthened in June 2007, when the revised International Health Regulations come into force.
3. *Strengthening health systems:* For health improvement to operate as a poverty-reduction strategy, health services must reach poor and underserved populations. Health systems in many parts of the world are unable to do so, making the

strengthening of health systems a high priority for WHO. Areas being addressed include the provision of adequate numbers of appropriately trained staff, sufficient financing, suitable systems for collecting vital statistics, and access to appropriate technology including essential drugs.

4. *Harnessing research, information and evidence:* Evidence provides the foundation for setting priorities, defining strategies, and measuring results. WHO generates authoritative health information, in consultation with leading experts, to set norms and standards, articulate evidence-based policy options and monitor the evolving global heath situation.
5. *Enhancing partnerships:* WHO carries out its work with the support and collaboration of many partners, including UN agencies and other international organizations, donors, civil society and the private sector. WHO uses the strategic power of evidence to encourage partners implementing programs within countries to align their activities with best technical guidelines and practices, as well as with the priorities established by countries.
6. *Improving performance:* WHO participates in ongoing reforms aimed at improving its efficiency and effectiveness, both at the international level and within countries. WHO aims to ensure that its strongest asset - its staff - works in an environment that is motivating and rewarding. WHO plans its budget and activities through results-based management, with clear expected results to measure performance at country, regional and international levels.

Budget: The framework for the financial resources and expenditures of WHO is derived from the 11th General Program of Work, which covers the period 2006-2015. From the biennium 2008-2009, a six-year medium-term strategic plan (for 2008-2013) encompassing three biennial budget periods will form the framework for WHO's results-based management. The strategic plan and the first of its three Program Budgets (for 2008-2009) were adopted by the World Health Assembly in May 2007. The relationship between these sources has changed significantly over the past few bienniums. The level of the regular budget has increased at a much slower rate than that of voluntary contributions. Voluntary contributions projected for 2006-2007 represent more than 70% of the total financial resources of the Organization.

- US$ 915 million assessed contributions and miscellaneous income (the regular budget) of which the assessed contributions by Member States totals to US$ 893 million
- US$ 2.4 billion voluntary contributions (from countries, specialized agencies and other partners)

WHO fulfils its objectives through its core functions:

- providing leadership on matters critical to health and engaging in partnerships where joint action is needed;
- shaping the research agenda and stimulating the generation, translation and dissemination of valuable knowledge;
- setting norms and standards and promoting and monitoring their implementation;
- articulating ethical and evidence-based policy options;
- providing technical support, catalyzing change, and building sustainable institutional capacity; and
- monitoring the health situation and assessing health trends.

These core functions are set out in the 11th General Program of Work, which provides the framework for organization-wide program of work, budget, resources and results. Entitled "Engaging for health", it covers the 10-year period from 2006 to 2015.

The United Nations Children's Fund (UNICEF): Unicef General Assembly was created on December 11, 1946. In 1953, its name was shortened from United Nations International Children's Emergency Fund, but is still known by the popular acronym based on this old name. Headquartered in New York City, UNICEF provides long-term humanitarian and developmental assistance to children and mothers in developing countries. A partly voluntarily funded agency, UNICEF relies on contributions from governments and private donors. Its programs emphasize developing community-level services to promote the health and well-being of children. UNICEF was awarded the Nobel Peace Prize in 1965 and Prince of Asturias Award of Concord in 2006.

Priorities

UNICEF mainly helps out in the poorer regions of Africa although it has done charity work all over the world. UNICEF is currently focused on 5 primary priorities:

- Child Survival and Development,
- Basic Education and Gender Equality (including girls' education),
- Child protection from violence, exploitation and abuse,
- HIV/AIDS and children, and
- Policy advocacy and partnerships for children's rights.

Related areas of UNICEF action include early childhood development, adolescence development and participation, life skills based education, etc. UNICEF works to improve the status of their priorities through 14 methods ranging from direct and legal interventions to education and beyond to research and census data collection.

1. Child Survival and Development: Unicef has promoted safe delivery, neonatal care, breastfeeding and nutrition growth monitoring. Recent IMCI strategy which is changed to IMNCI strategy in India is for child survival and development.

Immunization plus: Immunization is a direct intervention method which has made great improvements in the health of children worldwide over the past 20 years. But every year, more than 2 million children die from diseases that could have been prevented by inexpensive *vaccines*. The plus in the program is the additional immunizations made possible during interventions. Ranging from client education to *nutritional supplements* to *insecticide*-treated mosquito netting, these life-saving services make immunization programs a powerful tool for child health.

2. Education: Education is a proven intervention for improving the lives of all people, including children. Educating young women yields spectacular benefits for the current and future generations, and specifically affects a range of UNICEF priorities including child survival, children in family, immunization, and child protection.

3. Child protection and well-being: UNICEF uses the term 'child protection' to refer to preventing and responding to violence, exploitation and abuse against children – including commercial *sexual exploitation, trafficking, child labor* and harmful traditional practices, such as *female genital mutilation*/cutting and *child marriage*. UNICEF's child protection programs also target children who are uniquely vulnerable to these abuses, such as when living without parental care, in conflict with the law and in armed conflict. Violations of the child's right to protection take place in every country and are massive, under-recognized and under-reported barriers to *child survival* and development, in addition to being human rights violations. Children subjected to violence, exploitation, abuse and neglect are at risk of death, poor physical and mental health, HIV/AIDS infection, educational problems, displacement, *homelessness, vagrancy* and poor parenting skills later in life. Among many other programs, UNICEF supports the international *Child Rights Information Network.*

4. HIV/AIDS: 15 million children are now orphaned due to AIDS. It is estimated that by the year 2010 in sub-Saharan Africa alone, more than 18 million children will have lost at least one parent to AIDS. Half of all new infections are people under the age of 25, with girls hit harder and younger than boys. Working to protect and support orphaned children. Unicef is also running several programs dedicated to controlling both online and off-line child pornography.

5. Early childhood: Every child must be ensured the best start in life – their future, and indeed the future of their communities, nations and the whole world depends on it.

UNICEF applies a holistic, evidence-based approach to Early childhood, including the following principles: Preventive and curative health care including immunization, adequate nutrition, and safe water and basic sanitation must be provided as a sine qua non.

Structure of the organization

The heart of UNICEF's work is in the field, with staff in over 150 countries and territories. More than 120 country offices carry out UNICEF's mission through a unique program of cooperation developed with host governments. Seven regional offices guide their work and provide technical assistance to country offices as needed. Overall management and administration of the organization takes place at its headquarters in New York. UNICEF's Supply Division is based in Copenhagen and serves as the primary point of distribution for such essential items as lifesaving vaccines, antiretroviral medicines for children and mothers with HIV, nutritional supplements, emergency shelters, educational supplies, and more.

UNICEF is supported entirely by voluntary funds. Governments contribute two thirds of the organization's resources; private groups and some 6 million individuals contribute the rest through the National Committees. The non-governmental organizations are primarily responsible for fund raising, selling UNICEF greeting cards and products, creating private and public partnerships, advocating for children's rights, and providing other invaluable support. The U.S. Fund for UNICEF is the oldest of the National Committees, founded in 1947.

Guiding and monitoring all of UNICEF's work is a 36-member Executive Board which establishes policies, approves programs and oversees administrative and financial plans. The Executive Board is made up of government representatives who are elected by the United Nations Economic and Social Council, usually for three-year terms.

The UNICEF Innocenti Research Centre: UNICEF Innocenti Research Centre in Florence, Italy, was established in 1988 to strengthen the research capability of the United Nations Children's Fund (UNICEF) and to support its advocacy for children worldwide. The Centre, formally known as the International Child Development Centre, has as its prime objectives to improve international understanding of the issues relating to children's rights, to promote economic policies that advance the cause of children, and to help facilitate the full implementation of the United Nations Convention on the Rights of the Child in industrialized and developing countries.

Employment policy: In recent years UNICEF HQ in New York City has drastically decreased hiring full time employees, preferring instead to hire disposable contractors. These contractors work full time without any legal benefits, while UNICEF staff receive medical benefits, paid vacation, sick time, and access to assorted UN benefits such as a living stipend, an education stipend, paid travel and full access to the UN Secretariat grounds.

Sponsorship: Recently, UNICEF has begun partnerships with world-class athletes and teams, to promote the organization's work and to raise funds.

Trick-or-Treat UNICEF box: Since 1950 when a group of children in Philadelphia, Pennsylvania donated $17 they received on Halloween to help post-World War II victims, the Trick-or-Treat UNICEF box has become a tradition in North America during the haunting season. These small orange boxes are handed to children at schools and at various locations (such as Hallmark Gold Crown Stores) prior to October 31. To date, the box has collected approximately $91 million dollars (CAD) in Canada and over $132 million (US) in the USA.

Content of services in India

Child health :

- ✓ IMNCI
- ✓ Immunization
- ✓ ORS/Zn therapy for diarrhoea
- ✓ Special Care New Born Units
- ✓ Maternal & Perinatal Death Inquiry And Response
- ✓ Other work: current focus on providing primary health care to mothers and children

Nutrition :

- ✓ Supports the Government in its objectives to reduce and prevent malnutrition, and to improve the development of children under three years old, especially those in marginalized groups.
- ✓ Iron supplementation for adolescent girls and Vitamin A supplementation where xerophthalmia is prevalent.
- ✓ expansion and enhancement the quality of ICDS.
- ✓ community-based early childcare interventions.

Water, environment and sanitation :

- ✓ The current priority is to maintain water systems, monitor and regulate water quality and ensure sustainability of sources.
- ✓ UNICEF action on the Child's Environment

· Improve the child's household hygiene and sanitation environment

· Improve the child's school environment

· Improve community management and sustainability of water and sanitation interventions

HIV/AIDS :

- ✓ As a part of the joint UN response and within the context of NACP III, UNICEF collaborates with the Government of India and other partners in four key areas we call

the 4 Ps: Primary prevention, PPTCT, Pediatric HIV/AIDS & Protection, support and care of affected children.

Education:

- ✓ Both formal and non formal education.
- ✓ Assists India in improving teaching sciences: library books, laboratory equipments, workshop tools, AV aids.

Child Protection:

- ✓ UNICEF Child Protection Program in India focuses mainly on three areas of intervention: child labor, child trafficking, and children in difficult circumstances.

Child survival & development Revolution, 1982 focused on 4 inexpensive interventions to reduce child deaths called as GOBI strategy. Later on 3 Fs have been added. GOBI-FFF is food security, female education & family Planning.

FAO: Food and Agriculture Organization (FAO) was formed in 1945 with HQ in Rome.

- The chief aims are: to raise living standards, improve nutrition of all people, to increase efficiency of farming, forestry and fisheries and to better the condition of rural people.
- Some important initiatives by FAO are:
- Freedom from Hunger Campaign in 1960.
- Codex Alimentarius Commission set up in 1962.
- First World food Day observed on 16th Oct, 1981.
- Special Program for food security launched in 1994.
- International treaty on plant genetic resources for FAO in 2001.
- World Summit on Food Security to inject new urgency into the fight against hunger in 2009

World Trade Organization (WTO): is the only global international organization dealing with the rules of trade between nations. At its heart are the WTO agreements, negotiated and signed by the bulk of the world's trading nations and ratified in their parliaments. The goal is to help producers of goods and services, exporters, and importers conduct their business. The General Agreement on Tariffs and Trade (GATT) covers international trade in goods. The workings of the GATT agreement are the responsibility of the Council for Trade in Goods (Goods Council) which is made up of representatives from all WTO member countries.

World Trade Organization (WTO) is a major impetus for the liberalization of global trade. There have been the culminations of eight rounds of multilateral trade negotiations held over the past 50 years, the most recent being the Tokyo and Uruguay Rounds. The conclusion of the Uruguay round negotiations in 1994, marked by the Final Act, transformed the General Agreement on Tariffs and Trade (GATT) into a permanent international organization, the WTO (Bettcher 2000). The legal framework constituting WTO has been compared to a tricycle: "a driver (WTO), two large wheels (Multilateral Trade (in Goods) Agreements (MTAs) and the General Agreement on Trade in Services (GATS), and a smaller one (Trade-related Aspects of Intellectual Property Rights (TRIPS)" (Berrod 1995). With respect to public health, Article XX (b) under the General Exceptions section of the General Agreement on Tariffs and Trade (1994) allows each contracting party to set its human, animal or plant life or health standards if these restrictions do not represent an unjustifiable discrimination or a disguised restriction on international trade. This public health provision was recently upheld in a WTO dispute settlement panel, which upheld a French ban on asbestos that was challenged by Canada. Similarly, other WTO agreements, for example the Technical Barriers to Trade (TBT) (Article 2[2]) and the TRIPS Agreement (Article 8), contain similar provisions for the protection of public health and safety (Bettcher 2002).

World Bank: is an international financial institution that provides leveraged loans (takes the form of a loan or other borrowings (debt), the proceeds of which are (re)invested with the intent to earn a greater rate of return than the cost of interest) to developing countries for capital programs (water, sanitation, transport, telecommunication, health infrastructure). The World Bank has a stated goal of reducing poverty.

The World Bank comprises only two institutions: the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA). Beside International Monetary Fund, the World Bank is one of five

institutions created at the Bretton Woods Conference in 1944 and head office at Washington. From its conception until 1967 the bank undertook a relatively low level of lending. From 1968 to 1980 the bank concentrated on meeting the basic needs of people in the developing world. The size and number of loans to borrowers was greatly increased as loan targets expanded from infrastructure into social services and other sectors.

Lending to service third world debt marked the period of 1980–1989. Structural adjustment policies aimed at streamlining the economies of developing nations (at the expense of health and social services) were also a large part of World Bank policy during this period. Unicef reported in the late 1980s that the structural adjustment programs of the World Bank were responsible for the "reduced health, nutritional and educational levels for tens of millions of children in Asia, Latin America, and Africa" (Cornia 1987-88).

From 1989 World Bank policy changed in response to criticism from many groups. Environmental groups and NGOs were incorporated in the lending of the bank in order to mitigate the effects of the past that prompted such harsh criticism (Goldman 2005). Bank projects "include" green concerns.

The World Bank's current focus is on the achievement of the Millennium Development Goals (MDGs), lending primarily to "middle-income countries" at interest rates; while the IDA provides low or no interest loans and grants to low income countries with little or no access to international credit markets.

The World Bank sees the five key factors necessary for economic growth and the creation of an enabling business environment as:

1. **Build capacity**: Strengthening governments and educating government officials.
2. **Infrastructure creation**: implementation of legal and judicial systems for the encouragement of business, the protection of individual and property rights and the honoring of contracts.
3. **Development of Financial Systems**: the establishment of strong systems capable of supporting endeavors from micro credit to the financing of larger corporate ventures.
4. **Combating corruption**: Support for countries' efforts at eradicating corruption.
5. **Research, Consultancy and Training**: the World Bank provides platform for research on development issues, consultancy and conduct training programs (web based, on line, tele-/video conferencing and class room based) open for those who are interested from academia, students, government and non-governmental organization (NGO) officers etc.

Structure: The President of the Bank is responsible for chairing the meetings of the Boards of Directors (nominated by US government) and for overall management of the Bank. The Executive Directors, representing the Bank's member countries, make up the Board of Directors, usually meeting twice a week to oversee activities such as the approval of loans and guarantees, new policies, the administrative budget, country assistance strategies and borrowing and financing decisions. The Vice Presidents of the Bank are its principal managers, in charge of regions, sectors, networks and functions. There are 24 Vice-Presidents, three Senior Vice Presidents and two Executive Vice Presidents. The IBRD has 186 member countries, while the IDA has 168 members (The World Bank Group 2008).

The World Bank has long been criticized for free market reform policies and for monopoly of a small number of economically powerful countries because their interests dominate the bank (Woods 2006). The World Bank's obligations to donor countries and private capital markets have caused it to adopt policies which dictate that poverty is best alleviated by the implementation of "market" policies (Weavers 2008).

Some analysis shows that the World Bank has increased poverty and been detrimental to environment, public health, and cultural diversity (Stiglitz 2006). Some critics also claim that the World Bank has consistently pushed a neoliberal agenda, imposing policies on developing countries which have been damaging, destructive and anti-developmental (Ecologist 2007, Uvin 2002). It has also been suggested that the World Bank is an instrument for the promotion

of US or Western interests in certain regions of the world (Hertz 2004).

After these criticism the World bank has started various projects. Ongoing projects support national programs for disease control - such as malaria and other vector-borne diseases, polio, HIV/AIDS, and TB. They also support child nutrition and reproductive and child health programs. Projects are also working to strengthen state-level systems for rural healthcare, as well as national programs for food and drug regulation and disease surveillance.

International Labor Organization (ILO): This is also an UN body works for the rights of the workers. The following Conventions relating to freedom of association, discrimination, forced labor and child labor are regarded as the Fundamental Human Rights Conventions of the ILO:

No. 29, Forced Labor Convention, 1930 requires each State which ratifies it to suppress the use of forced or compulsory labor in all its forms within the shortest possible period. Forced or compulsory labor is defined as "all works or services which are extracted from any person under the menace of any penalty and for which the said person has not offered him voluntarily".

No. 87, Freedom of Association and Protection of the Right to Organize Convention, 1948 provides for the right of workers and employers, without any distinction, to establish and join organizations of their own choosing without previous authorization.

No. 98, The Right to Organize and Collective Bargaining Convention, 1949 aims to protect the exercise of the right to organize and to promote voluntary collective bargaining.

No. 100, Equal Remuneration Convention, 1951 requires each State to take steps to promote and establish methods for wage determination - ensure the application of the principle of equal remuneration for men and women workers for work of equal value.

No. 105, Abolition of Forced Labor Convention, 1957 supplements the earlier Forced Labor Convention and focuses on the abolition of forced labor.

No. 111, Discrimination (Employment and Occupation) Convention, 1958 requires that each Member State undertakes to promote equality of opportunity and treatment by means of a national policy which aims to end all forms of discrimination in employment and occupation.

No. 138, The Minimum Age Convention, 1973 States are required to pursue a national policy designed to ensure the effective abolition of child labor.

United Nations High Commissioner for Refugees (UNHCR): is an organization that promotes, organizes, coordinates, and supervises international action on behalf of refugees protected by former international agencies and on behalf of any person who is outside the country of his nationality (or if he has no nationality, the country of his former habitual residence) because he has been persecuted by reason of his race, religion, nationality, or political opinion, and cannot –or, owing to such fears, does not wish to-avail himself of the protection of that country. UNHCR is empowered to provide assistance, without a specific mandate, to countries which request it.

Regional Organizations

Commonwealth of Nations: is an association that comprises of the United Kingdom, its dependencies, and many former British colonies that are now sovereign states with a common allegiance to the British Crown, including Canada, Australia, India, and many countries in the West Indies and Africa. The Commonwealth is an association of sovereign nations which support each other and work together towards international goals. It is also a 'family' of peoples. With their common heritage in language, culture, law, education and democratic traditions, among other things, Commonwealth countries are able to work together in an atmosphere of greater trust and understanding than generally prevails among nations. It was formally established by the Statute of Westminster in 1931. At the start of 2007, there were 53 member countries in the Commonwealth. However, the Commonwealth has no formal constitutional structure. It works from understood procedures, traditions, and periodic statements of belief or commitment to action. Intergovernmental consultation is its main source of direction, enabling member governments to collaborate to influence world events,

and setting up programs carried out bilaterally or by the Commonwealth Secretariat, the association's main executive agency.

South Asian Association for Regional Cooperation (SAARC): SAARC was established when its Charter was formally adopted on December 8, 1985 by the Heads of State or Government of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. SAARC provides a platform for the peoples of South Asia to work together in a spirit of friendship, trust and understanding. It aims to accelerate the process of economic and social development in Member States.

Association of Southeast Asian Nations (ASEAN): was established on 8 August 1967 in Bangkok by the five original Member Countries, namely, Indonesia, Malaysia, Philippines, Singapore, and Thailand. Brunei Darussalam, Vietnam Lao PDR and Myanmar, and Cambodia joined later dates. The ASEAN Declaration states that the aims and purposes of the Association are: (1) to accelerate economic growth, social progress and cultural development in the region and (2) to promote regional peace and stability through abiding respect for justice and the rule of law in the relationship among countries in the region and adherence to the principles of the United Nations Charter.

Bilateral International Organizations

Bilateral organizations are formed on whenever they are required and remain functional till the objectives are achieved. In some instances, they become the long term organizations for mutual benefits. In brief some of such organizations are described below:

DFID India: The Department for International Development (DFID) is the British government department responsible for Britain's contribution towards international efforts to eliminate poverty. The organization works in partnership with developing country governments towards poverty alleviation. DFID was created in 1997 with headquarters in London. Key achievements are:- fighting AIDS, Tuberculosis, malaria; funding for children; funding for global health; fighting crime; aid to Africa and poor Asian countries; and peace building and humanitarian process.

DFID India is one of the number of DFID offices in the world and it implements DFID's largest single overseas program contributing to poverty eradication. DFID India works in partnership with the Government of India to achieve its national development targets and its commitment to the Millennium Development Goals. DFID India has a strategic National Programs and works in partnership with four focus states – Andhra Pradesh, Madhya Pradesh, Orissa and West Bengal. The organization has a staff of 112 persons based in New Delhi, and state offices in Bhopal, Bhubaneshwar and Kolkata.

Contributions in India

Poverty: Lifting millions out of poverty in Orissa, A.P and M.P through work on rural livelihoods, expanding the microfinance industry, providing better water and sanitation services to several million slum-dwellers, informing millions in India's poorest villages of their rights.

Health: supporting RCH-II (£252m), National Polio Eradication Program (£128m), RNTCP-II (£41.7m) and NACP-III (£102 m).

Education: DFID India spent a total of about £55m on education in 2006-07. DFID is currently supporting the GoI's Sarva Shiksha Abhiyan program with a £210 million commitment to achieve universal elementary education in India by 2010.

USAID India: USAID is an independent federal government agency that receives overall foreign policy guidance from the Secretary of United States. This supports long-term and equitable economic growth and advances U.S. foreign policy objectives by supporting: economic growth, agriculture and trade; global health; and, democracy, conflict prevention and humanitarian assistance.

USAID India's health activities increase access to family health care, nourish needy mothers and children, fight infectious diseases and prevent HIV/AIDS. USAID implements HIV/AIDS prevention, care and treatment as part of the President's Emergency Plan for AIDS Relief (PEPFAR), a U.S. Government-wide effort. India is a priority country under the plan, one of the largest health care initiatives of its kind. Health activities also include increasing the use of reproductive

health and family planning services through initiatives targeted at three north Indian states – an area home to more than 210 million people. USAID also supports implementation of the Directly Observed Treatment Short course strategy to control tuberculosis. To improve the effectiveness of child survival interventions, USAID helps develop urban health plans in Indian cities, and supports child health research activities as well as polio eradication efforts. USAID also helps promote proven health and diagnostic products through private sector markets.

Norwegian Agency for Development Co-operation, (Norad): is a directorate under the Ministry of Foreign Affairs of Norway Govt. In 2004 the Norwegian development cooperation administration was reorganized, and the responsibility for long-term government-to-government cooperation with developing countries was transferred from Norad to the Ministry. Norad will continue to be a leading centre for the development and delivery of expertise, and will help ensure the efficient administration of development assistance, including evaluation and quality assurance. Norad will also cooperate closely with other national and international experts. It will provide expert advice to the achievement of the Millennium Development Goals. Norad channels substantial funds through Norwegian non-governmental organizations, which are important partners in Norwegian development cooperation. It also cooperates closely with Norwegian companies, trade unions, research institutions and other civil society-organizations.

Canadian International Development Agency (CIDA): is Canada's lead agency for development assistance. It has a mandate to support sustainable development in developing countries in order to reduce poverty and to contribute to a more secure, equitable, and prosperous world. Canada's development cooperation policy and programs will:

- advance Canadian values of global citizenship, equity, and environmental sustainability, as well as Canadian interests regarding security, prosperity, and governance;
- deliver visible, durable impact on the world's key development challenges as identified in the Millennium Development Goals (MDGs);
- focus on reducing poverty through an effective and focused approach which will match Canadian niches with developing countries' needs in coordination with other donors;
- recognize and promote sustainable solutions to address the critical linkages between environmental degradation, poverty, and social inequity; and
- mobilize Canadians to build the society's capacity to contribute effectively to global poverty reduction.

It was established in 1968. CIDA's headquarters is located in Gatineau, Québec. Thematic priorities: Food Security, Children and Youth, and Sustainable Economic Growth. 3 main objectives of CIDA's country policy program for India is:

(i) To promote economic and social policy reforms in India.

(ii) To contribute to India's capacity to promote environmentally sound development.

(iii) To assist in building a stronger economic relationship between Private Sectors of both the Countries. CIDA's programming focus is on projects of humanitarian nature which emphasize poverty reduction, gender equity, environment, human rights and child labor.

Danish International Development Agency (DANIDA): is a Danish organization inside the Ministry of Foreign Affairs of Denmark, set up to provide humanitarian help and assistance in developing countries. Its name was originally DANAID. In Greek mythology, the Danaids were daughters of *Danaus* who killed their husbands and were condemned to fill a bathtub with water to wash away their sins. Because the buckets they were given to do this were actually sieves, they worked for all eternity in Tartarus without any progress. Thus the aid agency's name was changed from DANAID to DANIDA at the last minute when this unfortunate connotation was discovered. Danish organization inside the Ministry of Foreign Affairs of Denmark, set up to provide humanitarian help and assistance in developing countries. In 1978, the NPCB accepted assistance from DANIDA. This support primarily focused on nationwide expansion of infrastructure (equipment and mobile units) and for training of paramedical ophthalmic assistants. Funds were later added for central

monitoring, evaluation & the development of local education programs such as school vision screening programs. Since April 1986, by a bilateral agreement between GOI and Govt. of Denmark, DANIDA working together with the National Leprosy Eradication Program (NLEP) in India, called DANLEP.

Japan International Cooperation Agency (JICA): This international organization started in October 1954. It joined Colombo plan and initiated technical cooperation programs. In 1974 JICA was founded and in 1987 International Emergency Relief Team was formed. It has a mission to act as a bridge between the people of Japan and developing countries that will advance international cooperation through the sharing of knowledge and experience and will work to build a more peaceful and prosperous world. JICA activities are being reorganized around the three principles of (1) a field-oriented approach, (2) human security, and (3) effectiveness, efficiency, and speed. JICA's cooperation in India prioritizes poverty reduction that incorporates the perspective of human security. Specifically, approaches are made from two angles: (1) improving basic living standards (health care, population, education, and safe water) and (2) stable growth of the economy (agriculture and rural development, promotion of small and medium-sized enterprises and investment, building of economic infrastructure). Also, cooperation is provided for improvements in governance, responses to environmental problems caused by urbanization and industrialization, and the correction of gender disparities.

Non-Governmental Organizations (NGOs)

NGO is variably defined but is essentially characterized by non-affiliation with government and the state sector. Sometimes used interchangeably with terms such as grassroot organizations, voluntary sector, civil society, independent sector and non-state actors, the key features of the term NGOs in popular use denotes organizations that are non-profit making, non-violent, organized group of people who are seeking to influence policy but are not seeking government office (Willetts 1996). In addition, they are voluntary in membership and seek to remain independent of state influence. Definitions of NGOs generally exclude for-profit organizations (that is, private companies, business associations), criminal organizations, political parties, mass media, insurgent movements and churches in their strictly religious sense (Weiss 1996). NGOs vary remarkably in size, resources, scope of activity and goals. They range from the hundreds of thousands of local community groups around the world to large, relatively well funded and transnational NGOs such as Oxfam, Médecins Sans Frontiéres, and Save the Children (Bettcher 2002).

International Non-Governmental Organizations

Some of the international organizations which are working in various countries including India are mentioned below:

The International Union Against Cancer (UICC): UICC is the international non-governmental organization dedicated exclusively to the global control of cancer. Its vision is of a world where cancer is eliminated as a major life-threatening disease for future generations. UICC's mission is to build and lead the global cancer control community engaged in: a) sharing and exchanging knowledge and competence, b) transferring scientific findings to clinical, patient and public settings, c) systematically reducing and eliminating disparities in prevention, early detection and treatment and d) delivering the best possible care to people living with cancer in every part of the world. UICC's focus is on four strategic directions: Cancer prevention and control, tobacco control, knowledge transfer and capacity building and supportive care.

International Union Against Tuberculosis and Lung Diseases (IUAT): originally known as the International Union Against Tuberculosis (IUAT), the International Union was founded in Paris in 1920 and officially registered on 13 July 1956. Its denomination was changed on 20 September 1989 to become the International Union Against Tuberculosis and Lung Disease (Union). The Union has as its mission the prevention and control of tuberculosis and lung disease, as well as related health problems, on a world wide basis, with a particular emphasis on low income countries. Its goal is to promote national autonomy within the framework of the priorities of each country by developing, implementing and assessing anti-tuberculosis and respiratory health programs. The aims of the Union are: a) to gather and to disseminate knowledge on all aspects of tuberculosis and lung

disease, as well as HIV and resulting community health problems; b) to alert doctors, decision makers, opinion leaders and the general public to the dangers presented by tuberculosis and lung disease, as well as the community health problems associated with them; c) to coordinate, assist and promote the work of its constituent members throughout the world; and d) to establish and maintain close links with the World Health Organization, other United Nations organizations, and government and non-government institutions in health and development sectors.

Netherlands Leprosy Relief (NLR): was founded on 30th March 1967, with a commitment to promoting and supporting the fight against leprosy and the consequences of this disease. NLR is one of the founding members of ILEP. It has over 100 projects in about 20 countries. Leprosy is often neglected. It can stigmatize the patients and their families. The objective of NLR is to promote and support the control of leprosy and the after-effects of the disease through a public health approach, in compliance with the new Global Strategy of the World Health Organization and its operational guidelines. NLR supports national leprosy control programs and promotes the integration of these programs into the countries' health systems. Leprosy patients should have access to general health service facilities, where they will be diagnosed and treated and provided with adequate care, both during and after chemotherapy. NLR aims for comprehensive leprosy control and is increasing its activities in the field of rehabilitation. The cooperation with partners in endemic countries is mostly formalized in long-term agreements with the national health authorities. NLR is prepared to face the challenges of dealing with leprosy as a "normal" infectious disease within the general health care system, even under circumstances of relatively low incidence. Knowledge and skills of primary health care workers are of great importance for adequate leprosy control programs. NLR gives high priority to training and education of local health staff. In addition to its leprosy work in endemic areas, NLR is one of the major supporters of leprosy related scientific research.

Cooperative Assistance and Relief Everywhere (CARE): originally Cooperative for American Remittances to Europe is one of the world's leading humanitarian organizations fighting global poverty. CARE is independent, non-sectarian and non-governmental. CARE has projects in 72 countries around the world with a CARE International Secretariat in Geneva, Switzerland. CARE International Secretariat coordinates the efforts of twelve autonomous member-organizations in North America, Europe, Asia and Australia. Since 1950, CARE has been synonymous with providing relief and development in India. Owing to its well-established infrastructure, CARE is usually the first on the scene with food and other life saving assistance. After independence, when the nascent Indian state was taking tentative steps towards self-sufficiency, CARE worked to support the famine relief work besides seeing the nation through the refugee crises with food resources. Care works with Ministry of Women and Child Development, the Ministry of Health and Family Welfare and corresponding state- level bodies to improve the management of public health and nutrition programs CARE partners with national health institutions to leverage their technical support for national and NGO programs. For example, CARE has partnered with the National Institute of Nutrition, National Institute of Mental Health and Neuro-Sciences (NIMHANS) Bangalore to develop a model for pyscho- social care to help communities affected by disasters.

HelpAge: is formed in 1978 with active help from Mr. Cecil Jackson Cole, founder member of Help the Aged in United Kingdom. It is a secular, apolitical, non-profit and a non-governmental organization. HelpAge India is working for the cause and care of Older Persons, with the ultimate aim of empowering them to take decisions pertaining to their own lives. HelpAge India is one of the founding members of HelpAge International, a high profile body having 51 member countries representing the cause of the elderly at the United Nations. *Objectives:* a) To foster the welfare of the aged in India especially the needy aged; b) To raise funds for projects which assist the elderly irrespective of cast or creed; and c) To create in the younger generation and in society a social awareness about the problems of the elderly in India today. Over the years HelpAge India has changed its orientation from implementing welfare projects to those that focus on development. It now lays stress on income-generation and micro-credit projects that enable the participation of Older Persons in the mainstream of

society. HelpAge India maintains active liaison with both the Central and State Governments for advocating the cause of the elderly. It is a member of the National Council of Older Persons in the Ministry of Social Justice and Empowerment.

Rotary International: is a worldwide organization of business and professional leaders that provides humanitarian service, encourages high ethical standards in all vocations, and helps build goodwill and peace in the world. Approximately 1.2 million Rotarians belong to more than 32,000 clubs in more than 200 countries and geographical areas. The Objectives of Rotary is to encourage and foster the ideal of service as a basis of worthy enterprise and, in particular, to encourage and foster: a) the development of acquaintance as an opportunity for service; b) high ethical standards in business and professions, the recognition of the worthiness of all useful occupations, and the dignifying of each Rotarian's occupation as an opportunity to serve society; c) the application of the ideal of service in each Rotarian's personal, business, and community life; d) the advancement of international understanding, goodwill, and peace through a world fellowship of business and professional persons united in the ideal of service. It is helping in Pulse polio immunization.

ActionAid: is an international anti-poverty agency working in over 40 countries, taking sides with poor people to end poverty and injustice together. In India today they are working with more than 300 civil society organizations and over five million poor and excluded people in 24 states and two union territories. Their focus is on the rights of India's most marginalized communities: Native Indians and indigenous people, rural and urban poor, women, children and minorities. These groups face an acute lack of access to and control over resources, services, and institutions. They pay special attention to those in vulnerable situations such as people living with chronic hunger, HIV/AIDS or disability, migrant and bonded workers, children who are out of school, city-dwellers without a home, and people whose land or livelihood is under threat. Also, women and men, girls and boys who have been trafficked, displaced, or hit by natural and human-made disasters.

Amnesty International (AI): is a worldwide movement of people who campaign for internationally recognized human rights. AI's vision is of a world in which every person enjoys all of the human rights enshrined in the Universal Declaration of Human Rights and other international human rights standards. In pursuit of this vision, AI's mission is to undertake research and action focused on preventing and ending grave abuses of the rights to physical and mental integrity, freedom of conscience and expression, and freedom from discrimination, within the context of its work to promote all human rights. AI is independent of any government, political ideology, economic interest or religion. It does not support or oppose any government or political system, nor does it support or oppose the views of the victims whose rights it seeks to protect. It is concerned solely with the impartial protection of human rights. AI has a varied network of members and supporters around the world. Although they come from many different backgrounds and have widely different political and religious beliefs, they are united by a determination to work for a world where everyone enjoys human rights. AI is a democratic, self-governing movement. Major policy decisions are taken by an International Council made up of representatives from all national sections. AI's national sections, members and supporters are primarily responsible for funding the movement. No funds are sought or accepted from governments for AI's work investigating and campaigning against human rights violations.

Greenpeace: is an non-governmental organization and is present in 40 countries across Europe, the Americas, Asia and the Pacific. To maintain its independence, Greenpeace does not accept donations from governments or corporations but relies on contributions from individual supporters and foundation grants. Greenpeace has been campaigning against environmental degradation since 1971 when a small boat of volunteers and journalists sailed into Amchitka, an area north of Alaska where the US Government was conducting underground nuclear tests. This tradition of 'bearing witness' in a non-violent manner continues today, and their Ships are an important part of all their campaign work. They expose environmental criminals, and to challenge government and corporations when they fail to live up to their mandate to safeguard the environment and future. In pursuing of their mission, they have no permanent allies or enemies. They promote open, informed debate

about society's environmental choices. They use research, lobbying, and quiet diplomacy to pursue their goals, as well as high-profile, non-violent conflict to raise the level and quality of public debate.

Oxfam: During the Second World War, Greece was occupied by the Nazis. In 1941, the Allies imposed a naval blockade, and scarcely any food or medical supplies could get through, even to civilians. Famine quickly took hold. A national Famine Relief Committee was set up in May 1942 and support groups were formed throughout the country. They tried to persuade the British government to allow essential supplies through the blockade, and they raised funds for war refugees and displaced people across Europe. The Oxford Committee for Famine Relief met for the first time on 5 October 1942. Many of the Relief Committees were wound down after the war, but the Oxford Committee saw a continuing need and enlarged its objectives to include 'the relief of suffering in consequence of the war'. Activity then centered on the provision of food parcels and clothing to Europe. From 1948 grants were made to projects in Europe and elsewhere and in 1949 the Committee's objectives were again broadened to 'the relief of suffering arising as a result of wars or of other causes in any part of the world.' The Committee gradually became known by its abbreviated telegraph address, Oxfam (This name was formally adopted in 1965). Oxfam responds in emergencies to save lives; works with people to improve their lives and prospects through longer term development programs; and campaigns on the issues that we believe will achieve lasting change and an end to poverty.

Save the Children: is the leading independent organization creating lasting change in the lives of children in need in the United States and around the world. It is a member of the *International Save the Children Alliance*, comprising 28 national Save the Children organizations working in more than 110 countries to ensure the well-being of children. In January 1932 in a small room in New York City, a group of concerned citizens gathered to respond to the needs of the proud people of Appalachia hard hit by the Great Depression. The inspiration and vision for Save the Children came in part from the international children's rights movement which begun in England in 1919 by Eglantyne Jebb, founder of the British Save the Children Fund. From this early effort in the hills and hollows of Harlan County, Kentucky grew a self-help philosophy and practice which is still at work today in more than 45 countries — providing communities with help.

Advantages of International organizations:

1. Global reach of their operations and expertise of their staff.
2. They have significant influence over national programs, policies and legislations.
3. They help to strengthen international cooperation in areas such as health, security, economic and social matters.
4. They have gradually evolved from narrow spectrum to wide spectrum, covering areas beyond health.
5. They are flexible, transparent, accountable and efficient.
6. They strengthen public private partnerships

But there are some disadvantages as well:

1. They do not focus on inequitable distribution of resources in some countries.
2. They work on a vertical single focus disease control program.
3. Their priorities are constantly skewed by intense political pressure (due to inflow of voluntary contributions).
4. They act merely as aid providing agencies with no or little power of implementation.
5. Often they work with relatively weak and low prestige health ministries where most of the funds are spent on fellowships and study tours and workshops, with no room to assess strategic planning for the health sector.
6. Professional staff in these organizations is still doctors who are ill-quipped in the terms of policy and management.
7. Staff is dominated by professionals from developed countries.
8. In their staffing there is insufficient representation of poor countries.

National Organizations

Governmental Organizations

Public/government organization is a government, semi-government, administrative, fiscal or judicial body, department, commission, authority, agency or entity

(whether incorporated or not): (1) established by or under any law administered by the local government or (2) appointed by the local government, directly or indirectly, for a public purpose. But this excludes government business enterprises or institution for profit or an educational institution. There are many government health organizations. Some are autonomous in nature registered under Indian Societies Act or passed by separate Act of parliament, for example All India Institute of Hygiene and Public Health (AIIH&PH), All India Institute of Medical Sciences (AIIMS), National Institute of Mental Health and Neurosciences (NIMHANS), International Institute of Population Science (IIPS), etc. Similarly various societies are formed to run health programs at district and state levels in which government officials, civil bodies and citizens are members, for example District Blindness Control Society, State AIDS Control Society, etc.

Indian Red Cross Society (IRCS): was established in 1920 under the Indian Red Cross Society Act and incorporated under Parliament Act XV of 1920.The act was last amended in 1992 and of rules were formed in 1994. The IRCS has 35 State / Union Territories Branches with their more than 700 districts and sub district branches. The President of India is the President and Hon'ble Union Health Minister is the Chairman of the Society. The Indian Red Cross's programs are grouped into four main core areas: Promoting humanitarian principles and values; Disaster response; Disaster preparedness; and Health and Care in the Community. Red Cross promotes the Humanitarian values, which encourage respect for other human beings and a willingness to work together to find solutions to problems. Disaster response continues to represent the largest portion of IRCS work, with assistance to millions of people annually ranging from refugees to victims of natural disasters. Capacity building programs and activities include: management and volunteer training, improving branch structures, planning, fund-raising and gender equality. Other major activities includes : hospital services, blood bank, HIV/AIDS programs, home for disabled servicemen ,vocational training centers, tracing activities, maternity , child and family welfare, nursing, junior red cross activities, preparedness and prevention of communicable & infectious diseases, relief operations in fire, railway & other accidents and events.

National NGOs

Several voluntary organizations are working in the field of health. The role of these organizations outside the government is complementary in nature and not an alternative to work through a government system. The NGOs have the advantage of flexibility in procedures, can develop rapport with the local populations and also enjoy credibility with local people. Under the RCH Program, NGOs are assisted at various levels:

State NGOs: The State NGO Committee will be responsible for Mother nongovernmental organizations (MNGO) selection, recommendation of projects for GOI approval, fund disbursement, capacity building, monitoring and evaluation. The District RCH society is responsible for all the operational aspects of the program management at the district level. The district NGO committee holds the responsibility for recommendation of MNGO composite proposals to state RCH society, facilitating the signing of MOU with the MNGO and passes it on for fund release to state RCH society, under taking review meetings and periodic monitoring in the field for assessing FNGO/ MNGO.

Mother NGOs: The objectives of the MNGOs scheme, are to improve RCH indicators in the under served and unserved areas, with specific focus on MCH, FP, immunization, institutional delivery, RTI/STI, adolescent reproductive health care including gender concerns and male involvement. NGOs with substantial resources and proven competence are being selected as mother NGOs. Each MNGO has to work with only 3-4 field NGOs from each district, encouraging each MNGO to identify the underserved and un-served pockets within the district in consultation with district health officials. So far 306 mother NGOs working in 414 districts have been identified to screen, select, guide and monitor the work of smaller NGOs called *field NGOs* in specified districts. Some of them at national level are entrusted with the job of pre-appraisal, appraisal and evaluation work of other NGOs. Independent evaluation of mother NGOs is proposed.

Service NGOs: These are those who are expected to provide clinical services and other specialized aspects such as dai training, MTP, male involvement, covering 100,000 population contributing to achieving

the RCH objectives. NGOs with established institutional and infrastructure for service delivery are encouraged to compliment the public health care delivery system in RCH-II program. These SNGOs will cover an area co-terminus to that of a CHC/block PHC with approximately 100,000 population or around 100 villages. Service NGOs are expected to provide a range of clinical and non-clinical services directly to the community as an integral package of RCH-II services such as abortion, safe deliveries, treatment of RTI/STI, neonatal care, treatment of diarrhea and ARI. The SNGO must have appropriate staff infrastructure such as clinic/hospital, and ambulance.

Small NGOs: At the village, Panchayat and block level, small NGOs are being involved for advocating RCH and family welfare practices and general counseling. At the same time, individual NGOs are also being encouraged to propose innovative Programs. Small NGOs with limited resources are being assisted through mother NGOs.

Voluntary Health Association of India (VHAI) is a non-profit, registered society formed in the year 1970. It is a federation of 24 State Voluntary Health Associations, linking together more than 4000 health care institutions and grassroots level community health programs spread across the country. VHAI tries to achieve these goals through campaigns, policy research, advocacy, need based training, media and parliament interventions, publications and audio visuals, dissemination of information and running of health and development projects in difficult areas. VHAI's primary objective is to make health a reality for the people of India by promoting community health, social justice & human rights related to the provision and distribution of health services in India. VHAI works for people centered policies and their effective implementation. It sensitizes the general public on important health and development issues for evolving a sustainable health movement in the country with due emphasis on its rich health and cultural heritage.

Hind Kusht Nivaran Sangh was established on all India level in the year 1949.The aim of this organization is to act as a useful bridge between the Government and non-governmental organizations engaged in leprosy elimination, to strengthen collaboration and coordination for a common goal i.e. prevention and treatment of leprosy and rehabilitation of the cured person.

Objectives

- To eradicate and control the disease and assist the leprosy affected persons in their social and economic rehabilitation.
- To establish Coordination amongst all the organizations working in the field of leprosy in Delhi, and to render them necessary whenever desired.
- To provide services for the treatment of leprosy and conduct research on the social, psychological and economic conditions of the patients.
- To educate the patients and students in particular and the public at large about the various aspects of the disease and the plight of leprosy affected persons.
- To establish institutions, clinics and hospitals for the control and treatment of leprosy.

The *Sangh* is committed to provide information and treatment of leprosy from India. *Sangh* is also committed to provide Clinical Treatment of Leprosy. In pursuance of the above objectives the Delhi Branch of the Hind Kusht Nivaran Sangh established a colony "*Anand Gram*" comprising of 400 leprosy affected persons in the Year 1961. None of the inmates of this colony liked to go for begging. The following socio – economic rehabilitation programs were started for leprosy affected persons: a) Production of Handloom cloth; b) Physiotherapy unit and plastic surgery; c) Poultry farming; d) Cultivation of vegetables; e) Sewing center; f) Farming, etc.

Sulabh International Social Service is an organization founded in the year 1970, is the largest nationally and internationally recognized pan-India social service outfit with 60,000 volunteers on the rolls who work to promote human rights, environmental sanitation, health and hygiene, non-conventional sources of energy, waste management and social reforms through education, training and awareness campaign. It has developed a scavenging-free two-pit pourflush toilet (*Sulabh Shauchalaya*); safe and hygienic on-site human waste disposal technology; a new concept of maintenance and construction of pay and use public toilets, popularly known as *Sulabh* Complexes with bath, laundry and urinal facilities being

used by about ten million people every day and generation of biogas and biofertiliser produced from excreta-based plants, low maintenance waste water treatment plants of medium capacity for institutions and industries. The organization is now moving to other sectors such as education. *Sulabh* has thus set up a modern, humane social order based on goodwill and mutual cooperation. The United Nations Centre for Human Settlements has recognized Sulabh's cost-effective and appropriate sanitation system as a global 'Urban Best Practice' at the Habitat-II conference held at Istanbul (Turkey), in June, 1996. The Economic and Social Council of United Nations has granted Special Consultative Status to *Sulabh* in recognition of its outstanding service to mankind.

The Nutrition Society of India (NSI): was established in 1967, is an organization dedicated to keep abreast of the latest developments in the basic and applied aspects of science of Nutrition. The society continues to analyze issues related to the diverse aspects of nutrition. The society activities involve scientists, programmers and policy makers throughout the country and abroad who are working in the field. Through its annual conference, the society provides a forum for new ideas, encourages innovations, recognizes important research findings, increases awareness of the latest survey data and promotes action programs.

Prayas: is a voluntary organization of people of Delhi Police, Delhi School of Social Work and Shramik Vidyapeeth who joined hands to respond with emergency services for reorganizing and rebuilding the shattered lives of suffering children. Prayas got registered as a society under the societies Registration Act, 1860 in year 1988. Now the organization is serving around 50,000 children in 7 states of India. They do not just provide shelter, home and clothing to the underprivileged children but also try to find out the root causes behind their sufferings and strive for their holistic development. As humanitarian, gender-sensitive and child-focused development organization, Prayas aims at restoring the lost childhood of neglected children through legal and social rehabilitation.

Professional Bodies

In addition, there are various professional bodies such as Indian Medical Association (IMA), Indian Academy of Pediatrics (IAP), the Federation of Obstetrics and Gynecology Societies of India (FOGSI), are working for health in their respective fields. The are many organizations in public health also such as Indian Association of Public Health, Indian Association of Preventive & Social Medicine, Indian Society of Malaria and Other Communicable Diseases (ISMOCD), Indian Association of Epidemiologist, etc. Two main professional bodies in community medicine are:

Public Health Foundation of India

The public health challenges facing the nation require comprehensive, holistically designed responses for capacity building in the areas of public health education and research. To cater to this need, the Public Health Foundation of India (PHFI) has been set up, as a public-private partnership, with the following charter:

- Establishment of new institutes for public health education.
- Catalyzing the growth and evolution of existing public health training institutes;
- Establishing a strong research network of public health and allied institutions to undertake research which would advance public health goals in critical areas;
- Facilitating the establishment of an independent accreditation body to regulate standards of public health education.

Launched in 2006 it is managed by autonomous Governing Board representing Indian, and international academic institutions, philanthropists, and cooperate sector.

Indian Pubic Health Association (IPHA): is the premier organization of public health professionals in the country having multidimensional activities to promote the concept of preventive and promotive services for community health care in the country (IPHA 1999). With the active support of late Dr. B. C. Roy, the then Chief Minister of West Bengal, the Association was inaugurated on the 28th September 1956 by the then Union Health Minister Raj Kumari Amrit Kaur at the All India Institute of Hygiene and Public Health, Calcutta. The birth of the Association was further edified by the publication of a highly informative Souvenir on "Health of India" and the inaugural issue of the *Indian Journal of Public*

Health- a quarterly journal. The association had joined the 'World Federation of Public Health Associations' (Geneva).

Since its inception the headquarters of the Association has been placed at the All India Institute of Hygiene and Public Health, Calcutta. **The main objectives of the Association are:** Promotion and advancement of public health and allied sciences in their different branches in India, protection and promotion of public and personal health of the people of the country and promotion of cooperation and fellowship among the members of the Association. Some of the other objectives are: Behavioral Science Institute and organize conferences, meetings, lectures and demonstrations in any aspect of public health and social welfare, publish in a scientific journal specially adopted to the needs of administration, research workers in public health in India, dissemination of health knowledge and conduct educational campaigns among different sections of the population, particularly in schools, colleges and cultural bodies, rural setting, encourage research in public health and raise funds for the purpose and publish transaction and other paper embodying researches conducted by the member or communicated under the auspices of the Association.

Indian Association of Preventive and Social Medicine: is one of the health professional bodies founded in 1974, a non profit professional organization of specialists in Epidemiology, Health Management, Health Promotion, and Family Medicine, which is dedicated to the promotion of public health by bringing its members' expertise to the development of public health policies, an advocate for education, research, and programs of Community Medicine and providing a forum for the regular exchange of views and information. Its official journal is known as Indian Journal of Community Medicine.

With the realization of the immense value of the science and art of Preventive and Social Medicine for Medical Students, Researchers, Practitioners, Public and State and in view of the fact that Preventive and Social Medicine forms the basis for the practice of all clinical specialties, the following are the aims of the society:

1. To improve the teaching standards of Preventive and Social Medicine at all levels.
2. To promote research in the specialty of Preventive and Social Medicine, and the effective application of the knowledge acquired in teaching, training, research and services.
3. To facilitate coordination amongst the Departments of Preventive and Social Medicine and other departments, medical colleges / institutions and health agencies / organization.
4. To develop cooperation in teaching, training, research and service between the Departments of Preventive and Social Medicine of various medical colleges / institutions in the country.
5. To facilitate coordination amongst the departments of Preventive and Social Medicine in colleges / institutions and health agencies / organizations.
6. To promote welfare of the teachers of the Preventive and Social Medicine.
7. To publish a journal which will be furtherance of these aims and will be the official organ of the Society.

COMMENTS

WB and IMF: The World Bank Group is the second largest public development institution in the world, lending around US$ 25 billion a year to reduce poverty and facilitate economic growth in developing countries. It now exerts the single largest influence over policy-making through the conditions attached to its loans, and the research and advice it provides to government. It has become a much bigger influence than the WHO in the health sector. World Bank and International Monetary Fund have a growing influence on population health that outweighs WHO's. Bank now operates in direct competition with WHO as the leading influence on health sector policy (People's Health Movement).

The package of liberation, deregulation and privatization, known as the Washington Consensus, has failed to achieve the promised economic growth (SAPRIN 2004). Imposition of the conditions has often led to the destruction of entire sectors of the economic and severely undermined social services. Many countries have experienced 'IMF riots' after conditions requiring wage freezes or the removal of price controls pushed vulnerable citizens over the edge (Kruse 2003). The use of explicit conditions tied to specific loans is simply ineffective. They are often imposed without regard to the country's historical, social, economic and institutional characteristics. Bank-funded construction

of hydroelectric dams has resulted in the displacement of indigenous people without proper compensation and destroyed fragile ecosystems. There is particular concern over continued support for oil, gas and mining projects, and the conflict between Bank rhetoric on climate change and the reality of its lending programs. The Bank has yet to provide evidence that support for extractive industries fulfils its mandate to reduce poverty; local people subjected to the pollution of their air, land, and drinking water enjoy few-if any-of the benefits (People's Health Movement 2005).

WHO: In disease prevention and control WHO led the global eradication of smallpox. It is making good progress towards eradication of poliomyelitis, leprosy and dracunculiasis, and ongoing efforts to tackle malaria, cholera, tuberculosis and HIV/AIDS. Its leadership role in collecting, analyzing and disseminating health evidence is unrivalled. It is the leading global authority preparing guidelines and standards on numerous issues, and the foremost source of scientific and technical knowledge in health.

A number of criticisms have emerged out during the half century of its functioning (People's Health Movement 2005) but some are described below:

- WHO's 'vertical', single-focus disease control programs, reflecting the continued domination of biomedical thinking, are said to lack impact or sustainability and to hinder systemic and intersectoral approaches.
- The balance between normative, global standard-setting activities and technical cooperation with countries is said to be wrong.
- Its priorities are constantly skewed by intense political pressure from member states.
- It's multiple and sometimes conflicting role as advocate, technical adviser, monitor and evaluator limits its ability to discharge functions such as independent global reporting.
- It has not built effective partnerships with civil society.
- Its relations with other major international agencies, such as the Global Fund for AIDS, TB and Malaria, are dogged by turf wars.
- It is said to be compromising on values and moral principles by entering into public- private partnerships with business interest whose activities it should be condemning rather than courting.
- Its leadership is accused of being ineffective and is beset by rumors of corruption and nepotism.
- Its management is top –heavy, heretical, overpaid and centralized, ruling autocratically an entrenched, bureaucratic subculture.
- It staff are dominated by professionals from developed countries with insufficient representation of poor countries.

Unicef

The challenge for Unicef is to develop a working relationship with WHO that supports the mission of providing child health programs within comprehensive health system which in most of the times have become confronting. The organization's mission to protect, nourish and cherish children cannot be reduced to the mere delivery of life-saving technologies within the health sector which were lastly emphasized. It should be Unicef's mission to place the wellbeing of children at the center of the UN, and at the center of globalization. Unicef must also address its internal weaknesses and address the frequent media reports of waste, nepotism, cronyism, discrimination, and harassment with better management and effective action (Hackbarth 2004).

References

Aust A. Modern treaty law and practice. Cambridge: Cambridge University Press, 2000:xxxiv–xxxv.

Basedow J. The effects of globalization on private international law. In: Basedow J, Kono T, eds. Legal aspects of globalization. The Hague: Kluwer Law International, 2000:4–6.

Bettcher D, Lee K. Globalisation and public health. JECH 2002;56:8-17.

Bettcher D, Yach. The globalization of public health ethics? Millennium: J International Studies 1999; 27: 488-9.

Cornia GA. Adjustment with a Human Face. 2 vols. Oxford: Clarendon Press, 1987–1988.

Ecologist. ^ "Criticism of World Trade Organization, World Bank and International Monetary Fund - Editorial". The Ecologist (original), later republished at BNET Business Network. 2000-09. http://findarticles.com/p/articles/mi_m2465/is_6_30/ai_65653637. Retrieved 2007-10-07.

Evans G, Newnham J. Dictionary of international relations. London: Penguin Books, 1998:77, 261–5, 270–1, 552–3.

Fidler DP. International law and infectious diseases. Oxford: Clarendon Press, 1999:108.

Goldman M. Imperial Nature: The World Bank and Struggles for Social Justice in the Age of Globalization. New York: Yale

University Press, 2005, pp. 93–97
Hackbarth S. Unicef: suggestions for change. Lancet 2005; 365: 290-1.
Hillier T. Principles of public international law. London: Cavendish Publishing, 1999: 32–9.
Hertz N. I.O.U.: The Debt Threat and Why We Must Defuse It. London: Harper Perennial 2004.
Jenks CW. The world beyond the charter: in historical perspective a tentative synthesis of four stages of world organization. London: George Allen and Unwin, 1969:16.
Kaul I, Grunberg I, Stern MA. Global public goods: international co-operation in the 21st century. New York: Oxford University Press, 1999.
Kishore J. A Dictionary of Public Health. New Delhi: Century Publications 2007.
Kruse T. The IMF and Bolivian crisis (http://ifiwatchnet.org/doc/boliviaimf.pdf, accessed 26 Feb 2005).
Little R. Globalization and international regimes. In: Bayliss J, Smith S, eds. The globalization of world politics. Oxford: Oxford University Press, 1997:236–47.
Peopl's Health Movement. Global Health Watch 2005-2006: An alternate World Health Report. New York: Zed Books 2005.
People's Health Movement. Global Health Watch 2005-2007. New York: Zed Books Ltd.
Shelton D. Introduction: Law, non-law, and the problem of "soft law". In: Shelton D, ed. Commitment and compliance: the role of non-binding norms in the international legal system: Oxford: Oxford University Press, 2000:6.
Stiglitz JE. Making Globalization Work. New York and London: W.W. Norton & Company, 2006, pp. 17
Taylor P. The United Nations and international organization. In: Bayliss J, Smith S, eds. The globalization of world politics. Oxford: Oxford University Press, 1997:266–88.
Taylor P. International Organization in the Modern World. London: Pinter 1995: 139.
Uvin P. On High Moral Ground: The Incorporation of Human Rights by the Development Enterprise. In: PRAXIS The Fletcher Journal of Development Studies, Volume XVII pp1-11. Medford MA: Tufts University 2002. Online at: http://fletcher.tufts.edu/praxis/archives/xvii/Uvin.pdf
Weaver C. Hypocrisy Trap: The World Bank and The Poverty of Reform. Princeton and Oxford: Princeton University Press, 2008, pp.31–32.
Weiss T, Gordenker L, eds. NGOs, the UN, and global governance. Boulder: Lynne Rienner, 1996.
Willet W. Nutritional epidemiology. New York: Oxford University Press, 1989.
Woods N. The Globalizers: The IMF, the World Bank, and Their Borrowers. Ithica and London: Cornell University Press, 2006, pp.190
World Bank Group. http://go.worldbank.org/Y33OQYNE90. Retrieved 2008-02-06.

IMPORTANT NATIONAL & INTERNATIONAL DAYS RELATED TO HEALTH

Date	Title of Day
January	
12th Jan	National Youth Day (India)
30th Jan	Anti-Leprosy Day
February	
2nd Feb	World Wetland Day
28th Feb	National Science Day
March	
4th Mar	National Safety Day
8th Mar	International Women Day
8th Mar	Common Wealth Day
15th Mar	Consumer's Protection Day
15th Mar	World Disabled Day
21st Mar	World Forestry Day
22nd Mar	World Water Day
23rd Mar	World Meteorology Day
24th Mar	World TB Day
April	
5th Apr	National Maritime Day
7th Apr	World Health Day
18th Apr	World Heritage Day
22nd Apr	World Earth Day
23rd Apr	World Book Day
May	
1st May	Workers Day/CGHS Day
3rd May	World Press Freedom Day
8th May	Red Cross Day
11th May	Technology Day
12th May	International Nurse Day
14th May	Mother's Day
15th May	International Day of Families
17th May	World Hypertension Day
22nd May	International Biodiversity Day
31st May	World No-Tobacco Day
June	
4th June	International Day of Innocent Children Victim of Aggression
5th June	World Environment Day
5th June	National Filaria Day (India)
12th June	World Day Against Child Labor
14th June	World Blood Donation Day
17th June	World Day to Combat Desertification & Draught
26th June	International Day against Drug Abuse & Illicit Trafficking
July	
1st July	National Doctors Day (India)
6th July	World Zoonosis Day
11th July	World Population Day
25th July	Astronomy Day
28th July	World Nature Conservation Day
28th July	World Hepatitis Day
August	
6th Aug	Hiroshima Day
9th Aug	Nigasaki Day
9th Aug	International Day of the World's Indigenous People
12th Aug	International Youth Day
September	
5th Sept	Teachers' Day
8th Sept	World Literacy Day
8th Sept	World Rabies Day
8th Sept	Eye Donation Day
10th Sept	World Suicide Prevention Day
15th Sept	World Lymphoma Day
16th Sep	International Day the Preservation of the Ozone Layer
21st Sept	International Day for Peace
21st Sept	*World* Alzheimer's *Day*
26th Sept	Day of the Deaf
28th Sept	World Heart Day
28th Sept	Green Consumer Day
30th Sept	TB Seal Day
October	
1st Oct	International Day for older persons
1st Oct	Voluntary Blood Donation Day
2nd Oct	ICDS Day
2nd Oct	International Day of Non-Violence
4th Oct	World Animal Welfare Day
5th Oct	World Habitat Day
9th Oct	World Sight Day
10th Oct	World Mental Health Day
10th Oct	Human Rights Day
11th Oct	International Day for Natural Disaster Reduction
11th Oct	International Hospice Day
14th Oct	World Standards Day
15th Oct	World Student Day
16th Oct	World Food Day
17th Oct	World Anesthesia Day
17th Oct	International Day for the Eradication of

	Poverty
21st Oct	Global Iodine Def. Disorder Prevention Day
24th Oct	United Nation Day
29th Oct	National Day for Disaster Reduction (India)
31st Oct	National Anti-Terrorist Day (India)

November

7th Nov	National Cancer Awareness Day
10th Nov	World Immunization Day
10th Nov	International Science Day
14th Nov	World Diabetes Day
14th Nov	Children's Day
19th Nov	UIP Day
24th Nov	World Television Day
25th Nov	International Day for the Elimination of Violence Against Women

December

1st Dec	World AIDS Day
2nd Dec	National Population Day
3rd Dec	International Day for Disabled / Handicapped person
4th Dec	Chemical Disaster Prevention Day (India)
4th Dec	Yellow Ribbon Day (Delhi Govt.)
5th Dec	International Volunteer Day for Economic & Social Development
7th Dec	International Civil Aviation Day
11th Dec	International Mountains Day
14th Dec	National Energy Conservation Day
23rd Dec	Farmers Day
29th Dec	International Day for Biological Diversity

Important Weeks

1-7th Aug:	World Breast Feeding Week
25th Aug – 8th Sept:	Eye Donation Fortnight
1-7th Sept:	National Nutrition Week
9-14th Nov	International Week of Science & Peace

WORLD HEALTH DAYS (WHO)

Year	Theme
1950	Know Your Own Health Services
1951	Health for Your Child and the World's Children
1952	Healthy Surroundings Make Healthy People
1953	Health is Wealth
1954	The Nurse: the Pioneer of Health
1955	Clean Water Means Better Health
1956	Destroy Disease-Carrying Insects
1957	Food and Health
1958	Ten Years of health Progress
1959	Mental Illness and Mental Health in the World Today
1960	Malaria Eradication- A World Challenge
1961	Accidents Need Not Happen
1962	Preserve Sight-Prevent Blindness
1963	Hunger: Disease of Millions
1964	No Truce For Tuberculosis
1965	Smallpox-Constant Alert
1966	Man and His Cities
1967	Partners in Health
1968	Health In the World of Tomorrow
1969	Health, Labor and Productivity
1970	Early Detection of Cancer Saves Lives
1971	A Full Life Despite Diabetes
1972	Your Heart is Your Health
1973	Health Begins at Home
1974	Better Food for A Healthier World
1975	Smallpox-Point of No Return
1976	Foresight Prevent Blindness
1977	Immunize and Protect Your Child
1978	Down with High Blood Pressure
1979	A Healthy Child-A Sure Future
1980	Smoking or Health The Choice is Your
1981	Health For All by The Year 2000
1982	Add Life to Years
1983	Health For All BY The year 2000: The Count-Down has Begun
1984	Children's Health: Tomorrow's Health
1985	Healthy Youth: Our Best Resources
1986	Healthy Living: Everyone A Winner
1987	Immunization- A Chance for Every Child
1988	Health for All-All For Health
1989	Let's Talk Health
1990	Our Planet Our Health-Think Globally Act Locally
1991	Should Disaster Strike: Be Prepared
1992	Heartbeat- The Rhythm of health
1993	Handle Life With Care: Prevent Violence and Negligence
1994	Oral Health for a Healthy Life
1995	A World Without Polio: Target 2000.
1996	Healthy City for Better Life
1997	Emerging Infectious Diseases-Global Alert, Global Response
1998	Safe Motherhood: A Matter of Human Right
1999	Active Aging-Make the Difference
2000	Safe Blood Starts with Me: Blood Save Lives
2001	Mental Health: Stop Exclusion: Dare to Care
2002	Move for Health
2003	Healthy Environment for Children: Shape the future of Life
2004	Road Safety: Safe Road is no Accident
2005	Make Every Mother and Child Count
2006	Working Together
2007	International Health Security: Invest in health, build a safer future
2008	Protecting Health From Climatic Change
2009	Save lives. Make hospitals safe in emergencies

ABBREVIATIONS

ACSM	Advocacy, Communication and Social Mobilisation
ADB	Asian Development Bank
ADC	Assistant Development Commissioner
AEFI	Adverse Event Following Immunization
AFB	Acid Fast Bacillus
AFP	Acute Flaccid Paralysis
AI	Amnesty International
AIDS	Acquired Immunodeficiency Syndrome
AIIH&PH	All India Institute of Hygiene & Public Health
AIIMS	All India Institute of Medical Sciences
ANC	Antenatal Care
ANM	Auxiliary Nurse Midwife
ANSV	Annual Negative Slide Volume
APEC	Asia Pacific Economic Cooperation
API	Annual Parasite Incidence
ARI	Acute Respiratory Infection
ART	Anti Retroviral Therapy
ARTI	Annual Risk of Tuberculosis Infection
ASEAN	Association of South East Asian Nations
ASHA	Accredited Social Health Activist
AUWSP	Accelerated Urban Water Supply Program
AWC	Anganwadi Center
AWW	Anganwadi worker
AYUSH	Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homoeopathy
BCC	Behavior Change Communication
BCG	Bacillus Calmette Guarine
BDO	Block Development Officer
BEE	Block Extension Educator
BFHI	Baby Friendly Hospital Initiatives
BLAC	Block Leprosy Awareness Campaign
BMC	Brihan Mumbai Municipal Corporation
BMI	Bady Mass Index
BP	Blood Pressure
BPL	Below Poverty Line
BSUP	Basic Services for Urban Poor
CARE	Cooperative Assistance & Relief Everywhere
CBO	Community Based Organization
CBR	Crude Birth Rate
CDC	Centres for Disease Control & Prevention
CDPO	Community Development Project Officer
CGHS	Central Government Health Scheme
CHAI	Catholic Health Association of India
CHC	Community Health Centre
CHI	Community Health Insurance
CHW	Community Health Worker
CIDA	Canadian International Development Agency
CIF	Case Investigation Form
CII	Confederation of Indian Industries
CINI	Child In Need Institute
CMAI	Christian Medical Association of India
CMO	Chief Medical Officer
CMR	Child Mortality Rate
CNAA	Community Needs Assessment Approach
CNAMA	Community Needs Assessment and Monitoring Approach
COC	Combined Contraceptive pill
CPA	Consumer Protection Act
CPE	Cytopathic Effect
CPIP	City Programme Implementation Plan
CPR	Couple Protection Rate
CSF	Cerebrospinal Fluid
CSO	Civil Society Organizations
CSSM	Child Survival and Safe Motherhood
CTD	Central TB Division
CUHMU	City Urban Health Management Unit
CVD	Cardiovascular disease
Dai	Traditional Birth Attendant
DALY	Disability Adjusted Life Year
DANIDA	Danish International Development Agency
DAPCU	District AIDS Control and Prevention Unit
DBCS	District Blindness Control Society
DDC	Drug Distribution Center in Malaria Control
DDG	Deputy Director General
DDK	Disposable Delivery Kit
DDT	Dichloro-Diphenyl-Trichloroethane
DEMO	District Education and Media Officer
DFID	Department for International Development
DFWO	District Family Welfare Officer
DGHS	Director General of Health Services
DGHS	Director General of Health Services
DHA	District Health Authority
DHO	District Health Officer
DHO/DMO	District Health/Medical Officer
DHS	Directorate of Health Services
DIO	District Immunization Officer
DJB	Delhi Jal Board

DMC	Designated Microscopy Centre
DOTS	Directly Observed Treatment – Short course
DOTS	Directly Observed Therapy Short-course
DPMU	District Project Management Unit
DPT	Diphtheria, Pertussis, and Tetanus vaccine
DRS	Drug Resistance Surveillance
DSF	Demand Side Financing
DST	Drug Susceptibility Testing
DTC	District Tuberculosis Centre
DTCS	District TB Control Society
DTO	District Tuberculosis Offi cer
DTR	Deep Tendon Reflexes
DWCDO	District Women & Child Development Office
DWCUA	Development of Women and Children in Urban areas
E	Ethambutol
EAG	Empowered Action Group
EC	European Commission
ECOSOC	Economic and Social Council
ECTA	European Commission Technical Advisory
EIUS	Environmental Improvement of Urban Slums,
EMG	Electromyography
EmOC	Emergency Obstetric Care
ENT	Ear, Nose & Throat
EPA	Environmental Protection Authority
EPI	Expanded Program on Immunization
EQA	External Quality Assessment
ESI	Employees State Insurance
FAO	Food and Agriculture Organization
FBO	Faith-based organization
FCTC	Framework Convention on Tobacco Control
FMG	Finance Management Group
FOGSI	Federation of Obstetrics and Gynecology Societies of India
FP	Family Planning
FRU	First Referral Unit
FTD	Fever Treatment Depot
FWP	Family Welfare Program
GATT	General Agreement on Tariffs and Trade
GAVI	Global Alliance for Vaccines & Immunization
GBD	Global Burden of Disease
GBS	Guillain-Barré Syndrome
GDP	Gross Domestic Product
GIS	Geographic Information System
GMSD	Government Medical Store Depot
GNP	Gross Net Product
GoI/GOI	Government of India
GOI-MUD	Government of India, Ministry of Urban Development
HBCs	High Burden Countries
HE	Health Education
HH	Household
HIS	Health Information System
HIV	Human Immunodeficiency Virus
HIV/AIDS	Human Immunodeficiency Virus/ Acquired Immuno Deficiency
HKNS	Hind Kusht Nivaran Sangh
HMIS	Health Management Information System
HP	Health Post
HRA	Health Risk Assessment
HRD	Human Resource Development
HRD	Human Resource Development
H-t-H	House to House
I/C	In-charge
IAE	Indian Association of Epidemiologists
IAP	Indian Academy of Pediatrics
IAPSM	Indian Association of Preventive and Social Medicine
IAQ	Indoor Air Quality
ICB	International Competitive Bidding
ICC	Institutional Co-operation Component
ICCIDD	International Council for Control of Iodine Deficiency Disorders
ICDS	Integrated Child Development Services
ICMR	Indian Council of Medical Research
ICTC	Integrated Counselling and Testing Centre
IDA	International Development Assistant
IDSMT	Integrated Development of Small & Medium Towns,
IDSP	Integrated Disease Surveillance Program
IDU	Injecting drug user
IEC	Information Education Communication
IFA	Iron Folic Acid
IFA	Iron & Folic Acid
IGO	Intergovernmental organizations
IHSDP	Integrated Housing and Slum Development Program
IIPS	International Institute of Population Science
ILO	International Labor Organization
IMA	Indian Medical Association
IMA	Indian Medical Association
IMF	International Monetary Fund
IMR	Infant Mortality Rate
INGO	International non-governmental Organizations
INMCI	Integrated Management of Neonatal & Childhood Infections
IPD	In Patient Department
IPHA	Indian Pubic Health Association
IPHS	Indian Public Health Standards
IPP	India Population Projects
IPPI	Intensified Pulse Polio Immunization
IPV	Inactivated Polio Vaccine
IRC	International Red Cross
IRC	UNICEF Innocenti Research Centre
IRCS	Indian Red Cross Society
IRDA	Insurance Regulatory and Development Authority

IREDA	Indian Renewable Energy Development Agency
IRL	Intermediate Reference Laboratories
ISM	Indian System of Medicine
ISMOCD	Indian Society of Malaria and Other Communicable Diseases,
ISRO	Indian Space Research Organization
ISTC	International Standards for Tuberculosis Care
ITES	Information Technology Enabled Services
IUAT	International Union Against Tuberculosis and Lung Diseases
IUCD	Intra uterine contraceptive device
IUD	Intra-uterine Devices
JICA	Japan International Cooperation Agency
JJRY	Swarna Jayanti Shahari Rozgar Yojana,
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
JSY	Janani Suraksha Yojana
KAP	Knowledge, Attitude and Practices
Lakh	100,000
LCS	Low Cost Sanitation,
LHV	Lady Health Visitor
LMO	Lady Medical Officer
LNG	liquefied natural gas
LPG	liquid petroleum gas
LT	Laboratory Technician
MAS	Mahila Arogya Samiti
MBB	Marginal Budgeting for Bottlenecks
MCD	Municipal Corporation of Delhi
MCH	Maternal & Child Health
MCI	Medical Council of India
MDGs	Millennium Development Goals
MDR	Medical Device Record
MDR	Multi-Drugs Resistance Tuberculosis
MDR-TB	Multi Drug Resistant TB (resistance to at least rifampicin and isoniazid)
MDT	Multi-Drugs Therapy of Leprosy
MIFA	Management of Information for Action
MIS	Management Information System
MMR	Maternal Mortality Ratio
MMWR	Mortality and Morbidity Weekly Report
MNGO	Mother Non-governmental Organizations
MNL	Multinational companies
MO	Medical Offi cer
MOH	Ministry of Health
MOHFW	Ministry of Health and Family Welfare
MOTC	Medical Offi cer-Tuberculosis Control
MoU	Memorandum of Understanding
MPW	Multipurpose Worker
MS	Medical Superintendent
MSM	Men who have sex with men
MSM	Men having Sex with Men
MTCT	Mother To Child Transmission
MTP	Medical Termination of Pregnancy
NACO	National AIDS Control Organization
NACP	National AIDS Control Program
NATO	North Atlantic Treaty Organization
NCCP	National Cancer Control Program
NCMH	National Commission on Macroeconomics and Health
NDCP	National Deafness Control Program
NDMC	New Delhi Municipal Council
NFHS	National Family Health Survey
NGO	Non Governmental Organization
NHC	Neighborhood Committee
NHGs	Neighborhood Groups
NHP	National Health Policy
NHSRC	National Health System Resource Center
NICD	National Inst Communicable Diseases
NID	National Immunization Day
NIDDCP	National Iodine Deficiency Disorders Control Program
NIHFW	National Institute of Health & Family Welfare
NIMHANS	National Institute of Mental Health and Neuro-Sciences
NIN	National Institute of Nutrition
NIOH	National Institute of Occupational Health
NLEP	National Leprosy Elimination Program
NLR	Netherlands Leprosy Relief
NMHP	National Mental Health Program
NNMB	National Nutrition Monitoring Bureau
NNMR	Neonatal Mortality Rate
NORAD	Norwegian Agency for Development Co-operation
NPCB	National Program for Control of Blindness
NPEV	Non-polio Enterovirus
NPSP	National Polio Surveillance Project
NPSU	National Polio Surveillance Unit
NRA	National Regulatory Authority
NRHM	National Rural Health Mission
NRL	National Reference Laboratories
NRY	Nehru Rozjar Yojana,
NSDP	National Slum Development Program
NSI	The Nutrition Society of India
NTCP	National Tobacco Control Program
NTF	National Task Force
NTI	National Tuberculosis Institute
NTP	National Tuberculosis Programme
NUHM	National Urban Health Mission
NVBDCP	National Vector Borne Disease Control Program
OAS	Organization of American State
OBG	Onlay Bone Graft (dental procedure)
Obs/Gyn	Obstetrics and Gynecology
OCP/CC	Oral Contraceptive Pill / Clomiphene Citrate
ODA	United Kingdom Overseas Development Administration

OECD	Organization for Economic Cooperation and Development
OI	Opportunistic Infection
OIC	Organization of Islamic Conference
OPD	Out Patient Department
OPEC	Organization of the Petroleum Exporting Countries
OPV	Oral Polio Vaccine
OR	Operational Research
ORI	Outbreak Response Immunization
ORS	Oral Rehydration Salts Solution
ORT	Oral Rehydration Therapy
OSE	On-site Evaluation
OTC	Over the Counter
Panchayat	Elected body of the village
PEM	Protein Energy Malnutrition
PEP	post-exposure prophylaxis
PEPFAR	President's Emergency Plan for AIDS Relief
PFA	Prevention of Food Adulteration Act
PHC	Primary Health Care/Center
PHFI	Public Health Foundation of India
PHN	Public Health Nurse
PID	Patient Identification Digit
PIP	Pilot Implementation Plan
PMIUPEP	Prime Minister's Integrated Urban Poverty Eradication Program,
PMOA	Paramedical Ophthalmic Assistants
PMTC	Prevention of mother-to-child transmission
PMU	Program Management Support Unit
PNC	Post Natal Checkup
PNDT	Prenatal Diagnostic Technique Act
POP	Plan of Operation
POP	Progesterone Only Pill
PP	Private Practitioner
PPI	Pulse Polio Immunization
PPM	Public-Private Mix
PPP	Public Private Partnership
PPTCT	Prevention of Parent to Child Transmission
PRI	Panchayati Raj Institutions
PSU	Public Sector Units
PTB	Pulmonary Tuberculosis
PUHC	Primary Urban Health Center
PWB	Patient-wise Box
QA	Quality Assurance
R	Rifampicin
RBM	Results Based Management
RBM	Roll Back Malaria
RBRC	Random Blinded Re-Checking
RCH II	Reproductive and Child Health
RCH	Reproductive and Child Health
RDKs	Rapid Diagnostic Kits
RET	Regional Evaluation Team
RHIME	Representative, Re-sampled, Routine Household Interview of Mortality with Medical Evaluation
RMP	Registered Medical practitioner
RNTCP	Revised National Tuberculosis Control Program
RTI	Reproductive Tract Infection
RTI/STI	Reproductive/ Sexually Transmitted Infections
SAARC	South Asian Association for Regional Cooperation.
SACS	State AIDS Control Society
SC	Scheduled Caste
SC	Sub centre
SCC	Short Course Chemotherapy
SCOVA	Standing Committee on Voluntary Action
SDS	State Drug Stores
SEARO	South-East Asian Regional Office
SEPIO	State EPI Officer
SHG	Self help group
SHI	Social Health Insurance
SHS	State Health Society
SI	Sulabh International
SIA	Supplemental Immunization Activities
SIDA	Swedish International Development Agency
SMO	Surveillance Medical Officer
SNGO	Service Non-governmental Organization
SNGO	State Non-governmental Organization
SNID	Sub-national Immunization Day
SPIP	State Program Implementation Plan
SPMU	State Project Management Unit
SPR	Slide Positivity Rate
SRH	Sexual and Reproductive health
SRS	Sample Registration system
ST	Scheduled Tribes
STC	State TB Cell
STDC	State Tuberculosis Training & Demonstration Centre
STDs	Sexually Transmitted Diseases
STF	State Task Force
STI	Sexually transmitted infection
STLS	Senior TB Laboratory Supervisor
STM	Standard Treatment Manual
STO	State TB Officer
STS	Senior Treatment Supervisor
SWOT	Strength, Weakness, Opportunities & Threat
TB	Tuberculosis
TBA	Trained Birth Attendant
TBCTA	Tuberculosis Coalition for Technical Assistance
TCG	Technical Consultative Group
TCG	Thrift Credit Groups
TERI	The Energy and Resources Institute (India)
TFR	Total Fertility Rate
TI	Targeted intervention
TM	Transverse Myelitis
ToR	Terms of Reference
TRC	Tuberculosis Research Centre

TRIPS	Trade-related Aspects of Intellectual Property Rights
TT	Tetanus Toxoid
TU	Tuberculosis Unit
U5MR	Under 5 Mortality Rate
UBS	Urban Basic Service
UBSP	Urban Basic Service for the Poor,
UFWC	Urban Family Welfare Centers
UHC	Urban Health Center
UHP	Urban Health Post
UHRC	Urban Health Resource Center
UICC	The International Union Against Cancer
UIP	Universal Immunization Program
ULB	Urban Local Body
ULBs	Urban Local Bodies
UN	United Nations
UNAIDS	United Nations Joint Program for HIV /AIDS
UNDP	United Nation Development Program
UNDRO	Office o the United Nations Disaster Relief Coordinator
UNEP	United Nations Environment Program
UNESCO	United National Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nation Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNICEF	The United Nations Children's Fund
USAID	United States Agency for International Development
USEP	Urban Self-Employment Program
USHA	Urban Social Health Activist
USP	Universal safety precautions
UT	Union Territory
VBD	Vector Borne Diseases
VCT	Voluntary counselling and testing
VCTC	Voluntary Counseling and Testing Center
VHAI	Voluntary Health Association of India
VPD	Vaccine Preventable disease
WB	World Bank
WCD	Women and Child Department
WFP	World Food Program
WHO	World Health Organization
WTO	World Trade Organization
XDR-TB	Extensively Drug Resistant TB
Z	Pyrazinamide
ZDV	Zudavudine
ZTF	Zonal Task Force

INDEX

A

AADHAR *173*
Aadhar 780
ABC analysis *247*
Absolute Blindness 518
ACCORD 35
Accreditation 108
Accredited Social Health Activist 23, 89, 120
Accredited Social Health Activists 119, 120
  Responsibility of 120
Achievements of India 713
Acid deposition 948
Acquired Immunodeficiency Syndrome 747
Act 822
  Air (Prevention and Control of Pollution) 949
  Atomic Energy 952
  Biomedical Waste (Management & Handling) Rules 936
  Bonded Labor 927
  Contract Labor 925
  Dangerous Machine 928
  Delhi Municipal Corporation 955
  Environment (Protection) Act 935
  Indian Red Cross Society 960
  Insecticide Act 952
  Minimum wages 924
  Motor Vehicles 956
  National Environment Tribunal 945
  National Rural Employment Guarantee 909
  Plantation Labor 926
  Trade Union 928
  Water (Prevention and Control of Pollution) 950
ActionAid 978
Actuary 918
Acute diarrhea *185*
Acute Respiratory Infection *188*
Acute Respiratory Infections *188*
  see ARI 189
Acute Respiratory Tract Infection *191*
AD syringe *202*
Addict 858
Adjudicating Officer 871
Adolescent
  Schemes for Girls 497
Adolescent Girls
  Schemes for 497
Adolescent Health *164*
Adolescent Health Clinics *168*
Adolescent Nutrition *167*
Adulterant 868
adverse drug reaction 618
Adverse Events Following Immunization 759
Aedes aegypti 422
AEFI 759
Affected Families 818
Aging 605
agricultural laborer 817
Agriculture policies 709
AIDS 747
Air (Prevention and Control of Pollution) Act 949
Air Pollution 809, 946
Alcohol 541
Alcohol Abuse 553
Alcohol Dependence 553
Alcohol use 553
Alcoholism 552
aldehyde test 413
Alma Ata 7
Alphacypermethrin 397, 399
Amnesty International 978
Analysis of Health Situation 56
Anemia 48, 166, 192
Anemia, Prevention and Control *192*
Anganwadi 498
Anganwadi worker 498, 499
ANM 88
Annual Blood-Smears Examination Rate 386
Annual Parasite Incidence 387
Anopheles culicifacies 372
Antenatal care *172*
Anthrax 645
Anti malaria drugs 388
Antitobacco Program 596
Antituberculosis Drugs 279
API 375
Applied Nutrition Program 489
Argemone oil 867
ARI 28, *178*, *188*
  see Acute Respiratory Infection 189
Artemisinin based Combination Therapy 392
ASEAN 974
ASHA 89, 119, 120, 134
Association of Southeast Asian Nations 974
Atomic Energy Act 952
Audit 706
Autism 905
Auxiliary Nurse Midwife 88
Avian influenza 647, 650, 654
Avoidable blindness 518
Ayurveda 840
Ayurveda System 840
Ayurveda System of Medicine 840
Ayurvedic Colleges 27
AYUSH 77, 126

B

Baby Friendly Hospital Initiative *189*
Bacterial Index 446
Bajaj Committee 55
  see also Committee 55
  see Health Planning
    see Committee 55
Committee 55
Balwadi Nutritional Program 489
Balwant Rai Mehta Committee 54
Bancroftian filariasis 415
Basic Minimum Service Program 673
Basic Minimum Services 673
BCC *241*
Behavior Change Communication *241*, 402
Behavior change communication *252*
Behaviour Change Communication 113
Bharat Nirman 79
Bhore Committee 52
  see also Committee 52
  see Health Planning 52
Bifenthrin 399
Bilateral International Organizations 974
Bilateral organizations 964
Bio-repositories 756
Biodiversity 930
Biofenthrin 397
Biological weapons 643
Biomedical Waste (Management & Handling) Rules 936
Biomedical Waste Management 932
  Incinerators 940
Bioterrorism 643
Bird flu 650
Birth injury *178*
Birth order 48
Birth Rate 27, 48
Birth Rate, Statewise 28
Bitot's spot 192
Blindness 28, 518
blindness 518, 519
  causes of childhood 519
Blindness, Absolute 518
Blindness, Economic 518
Blindness, Legal 518
Blindness, Social 518
Body Mass Index 563
Bonded Labor 927
Borderline Leprosy 446
Bottom Up Approach 56
Bottom-up Approach 57
Braille 622
Break Bone Fever 425
Breast-feeding *189*
Breastfeeding 189
Brothel 880
Brugia Filariasis 414, 416
Triple Burden 5
Bureaucratic failures 11
Bureaucratization 96
Burn injury management program 628
Burn injury rehabilitation 628
Burn injury rehabilitation program 628
Burn Prevention 627

C

Campylobacter jejuni *185*
Canadian International Development Agency 975
Cancer 565
Cancer Atlas 573
Cancer Epidemiology 565
Cancer Registries 572
cancer train 567
Cancer Vaccine 573
Cancer vaccines 573
Cancers 28
Cannabis 858
Capital 703
Carbon monoxide 947
Cardiovascular Diseases 578
CARE 977
CARE PROVIDERS 85
Cataract 519, 521
Cataract Operation 521
causes of deaths 22
Causes of Maternal Death 172
CDPO 499
Census 17, 849
Census 2011 850
Census of India 849
Central Government Health Scheme 35, 86
Central Health Service 86
Central Insecticide Board 952
Centralized Health Planning 112
Chadha Committee 54
  see Health Planning 54
Challenges for Public Health 3
Chemical disasters 933
Chikungunya 431
Child 893, 894
Child Abuse 897
Child Deaths *178*
Child Development 31
Child Development Project Officer 499
Child Labor 894
Child Labor (Prohibition and Regulation) Act *166*, 895
Child Marriage Restraint Act *166*
Child Mortality 176
  Determinants *177*
  Determinants of 177
  Trends in 176
Child mortality 11, *176*, *177*
Child nutrition *179*
Child Survival 969
Chlamydia trachomatis 228
Chloroquine 392
Chopra Committee 53
Chronic Diarrhea 186
Chronic diarrhea *186*
CIDA 975
Cigarettes and Other Tobacco Products Act 856

Civil Registration System 19
Clean Water for All 71
Cleans 251
Climate Change 810
Climatic Change 3, 5
Climatic change 949
Clinical establishment 842
Clinical trial 758
Clofazimine 450
Cobalt Therapy 571
Code of Medical Ethics 835
Code of medical ethics 835
Cold Boxes *202*
Cold Chain *201*
Cold chain management 760
Cold Chain System *201*
Colostrum *189*
commercialization of health care 8
Bajaj Committee 55
Committee, Bajaj 55
Committee, Bhore 52
Committee, Chadha 54
Committee, Jangalwalla 55
Committee, Kartar Singh 55
Committee, Mudaliar 54
Committee, Mukherjee 54
Committee, Shrivastava 55
Common Mental Disorders 540
Common Minimum Program 675
Commonwealth of Nations 973
Communicable Diseases
Surveillance Actions in 477
Community Based Health Insurance 71
community based health insurance 34
Community Based Rehabilitation 624
Community Health Center 87, 674
community health center 87
Community Health Centers 27, 121, 127, 674
Community Health Workers 65, 142
Community Involvement 38
Community Need Assessment & Monitoring Approach *249*
Community participation 243
Community Risk Pooling And Health Insurance 681
Complementary Feed *191*
Complementary feeding *191*
Complicated malaria 373
Components of RCH *161*
Composition of ORS *187*
Comprehensive abortion care *221*
Comprehensive Emergency Obstetric Care *175*
Condoms 750
Congenital malformation *178*
Constitution of India 825
Consumer Protection Act 845
Contaminant 868
Contraceptive Prevalence 48
Contraceptive Prevalence Rate 27
Contract Labor Act 925
Contracting In *244*
Contracting out *244*
Control of trachoma 522
Control of Vitamin A Deficiency 522
Convention on Rights of persons with disabilities 825
Convention on the Rights of the Child 825
Cooperative Assistance and Relief Everywhere 977
COPYRIGHTS ACT 848
Cord infection *178*
Corona Virus 646
Coronary heart disease 578
Coronary Heart Diseases 28
Cost 704
Cost, Fixed 704
Cost Operating 705
Cost-benefit Analysis 705
Cost-Direct 704
Cost-utility Analysis 705
Country Program – 6 of UNFPA 746
Couple Protection Rate *160*
Covenant on Economic, Social and Cultural Rights 825
CPA 845
Creches 926
Cryptosporidium *185*
CSSM *159*
Curable Blindness 518
Cyclops 462
Cyfluthrin 397, 399

D

DALYs 24
Disability Adjusted Life Years 24
Dangerous Machine 928
DANIDA 975
Danish International Development Agency 524, 975
Dapsone 450
Dasgupta Committee 53
DATA SOURCES 16
Day carriers *202*
DDT 397
De-concentration 96
DEAFNESS 612
Dealth Rate, Statewise 28
Death Rate 27, 48
DEC 415, 418
Decennial Growth Rate 27
Decentralization 56
DECLARATION, MUMBAI 16
Deep freezers *201*
Dehydration 186
dehydration *186*
Delegation 96, 106
Delhi Municipal Corporation 955
DELHI NURSING HOMES REGISTRATION ACT 842
Delhi Nursing Homes Registration Act 842
Deltamethrin 397, 398
Dementia 540
Demographic changes 6
Demorming *192*
Dengue 421
see also Vector Borne Diseases 421
Dengue Hemorrhagic fever 421
Density of Population 27

Dental caries 599
Dentist Act 838
DENTISTS ACT 838
Depression 540
Devolution 96
Deworming Program *192*
DFID India 974
DIABETES 575
Diabetes 575
Diagnostic and Statistical Manual of Mental Disord 539
Diarrhea 28, *178*, *185*
Diarrhea Control Program *186*
Diarrhea, Treatment plans for *187*
Diarrheal disease *184*
Diarrhoeal Disease 184
Dichloro – diphenyl – trichloroethane 397
Diethyl Carbamazine 415
Dipstick Test 374
Disability 620, 903
disability 620
Disability Adjusted Life year 24
Disability and Mental Health 70
Disability Health 70
Disability rates 24
Disability, Risk factors of 23
DISABLED PERSONS 620
Disaster 633, 958
DISASTER MANAGEMENT 958
Disaster Management 633
Disaster Management Act 958
Disease 1
Disease Burden
  in elderly 607
Disease Burden High
  in India 27
Disease Burden, Reasons of 27
Disease Control Programs 123
Disease Eradication 29
Disease, Risk factors 23
District Blindness Control Society 523
district blindness control society 520
District Cancer Control Program 571
District Disability Rehabilitation Centres 621, 622, 623
District Health Plans 121
District Hospital and Knowledge Centre 113
District Level Household Survey 21
District Mental Health Program 545
District Rehabilitation Center 622
Dog control 469
Domestic Violence 874
Domestic violence 48
Donor Convergence *240*
DOTS *260*
Double Fortification of salt 493
Dowry 878
Dowry Prohibition Act 878
Dracunculosis 462
Dracunculus medinensis 462
Drug and Cosmetics Act 859
Drug and Magic Remedy Act 861
Drug De-addiction Program 552
Drug Formulary 617
Drug Policy 616
Drug regulation 75

E

e-Cigs 597
E-Waste 932
Earning Capacity
  Loss of 923
EBOLA 656
Economic blindness 518
Economic Macro 33
Efficiency Evaluation 704
Eleventh Five Year Plan 69
Eleventh Plan 98
Elimination 28, 29
Elimination, definition of 29
Elimination of Neonatal Tetanus *196*
Emergency Medical Relief 640
Employees' State Insurance Act 917
Employer-based schemes 34
empower women 11
Enegry Policies 710
Enhanced Malaria Control Project 377
Environment 935
Environment (Protection) Act 935
Environment Improvement in Urban Slums scheme 681
Environmental Health 5
Environmental health 68
Environmental Problems 812
environmental sustainability 12
Epidemic 477
Epidemic Disease Act 854
Epidemic preparedness 403
Epidemic Response 477
Epidemiological Transition 4
  in Public Health 4
Equity 3
Eradicate poverty 11
Eradication 28
  Criteria 29
Erythema Nodosum Leprosum 448
Escherichia coli *185*
ESI 917
Essential Medicines 616
essential newborn care *172*
Ethionamide *279*
Eutrophication 948
Evaluation 701
  Type of 702
Evidence-based policy 141
Exclusive Breast-feeding *189*
Exclusive Breastfeeding *189*
Expanded Program for Immunization 754
Expanded Program on Immunization *193*
Expectancy of Life 27
Expectation of life 720

F

Facility Based IMNCI *183*
Facility-based care *179*
Factories Act 915
Factory 915
Family Act 877
Family Court 877
Family Health Suraksha 157
Family Medicine 717
Family Planning *158*
  Evolution of 158
Family Welfare Program *158*
Female feticide *252*
Female genital mutilation *234*
Female Workers 914
  Legislation for 914
Fertility Rate 27
Feticide *234*
Filaria
  indices 415
Financial Interventions 33
Financial interventions 33
Financing Health Services 70
financing in the health 6
First Referral Care 121
First Referral Unit *175*
First Referral Units *175*
Five Year Plan
  Eight 67
  Eleventh 69
  Fifth 65
  First 63
  Four 64
  Ninth 67
  Second 64
  Seven 66
  Six 66
  Tenth 67
  Third 64
five year plan 63
Fixed Cost 704
Flavivirus 421
Flood 642
Folic Acid Supplementation *167*
Food 868
Food additive 869
Food Adulteration 869
Food Analysts 870
Food and Agriculture Organization 971
Food business 869
Food Contamination 869
Food regulation 76
FOOD SAFETY 870, 872
Food safety 869
Food Safety And Standards 867
Food Safety and Standards Authority of India 869
Food Safety Officer 871
Food-based solutions *187*
Framework Convention on Tobacco Control 596, 826
FRUs *175*
Fundamental Right 825

G

Gardasil Vaccine 574
Gender
  Mainstreaming 234
Gender Discrimination *234*
gender equality 11
Gender mainstreaming *235*
Gender Sensitization 769
Glaucoma 519
Global Action Plan For NCD 585
Global Alliance For Vaccines and Immunization *193*
Global elimination of blinding trachoma 527
Global Malaria Control Strategy 408
global partnership 12
Global Strategy For Occupational Health 484
Global warming 5
Globalization 964
Glucose Blood 577
GRADE system 759
Grades of Recommendation Assessment, Development a 759
Greenhouse effect 949
Greenpeace 978
Gross Domestic Product 6, 33
Gross National Income 33
Gross National Product 27
GUINEA WORM 462
Guinea Worm Eradication Program 462
Gutka 591

H

H1N1 647
H5N1 650, 651
HALE 105
HALE and child mortality 105
HALE and government health care expenditure 105
Handicap 1, 620
handicap 620
Hardcore areas 375
Hazardous drinking 553
Hazardous Wastes 943
Health 2
  Definition of 2
  Investment in 6
health 2
Health Act 826
Health Action 31
Health Action 31
Health appraisal 663
Health Care 82
Health care financing 32, 69
Health Care of Elderly 605
Health Care Providers 85
Health Care Service
  Russia 84
Health care services
  US 83
Health Care System 82, 83
  in India 82

of different countries 83
Health care system 83
Health care system, Commercialized 10
Health Care System. Bureaucratic failures 11
Health Crisis 15
Health crisis 15
Health Economics 33
Health Economics, Macro 33
Health economics, Micro 33
Health Equity *237*
Health Expenditure 27, *238*
health expenditure 132
Health facilities in India 674
Health Financing 33, 123
Sources of 6
Health for All 30
Health for all 7, 15
Health For all by 2000 66
Health for all, demise of 7
HEALTH INDICATORS 24
Health Indicators 28
Countrywise 43
Health indicators 1
Health indicators, Bengladesh 43
Health indicators, China 43
Health indicators, India 43
Health indicators, Japan 43
Health indicators, Nepal 43
Health indicators, Pakistan 43
Health indicators, Srilanka 43
Health indicators, UK 43
Health indicators, USA 43
health inequity *237*
Health Insurance 34
Health Insurance, Employer-based schemes 34
Health Intervention 32
Health Interventions 32
Health Management Information System 68, *248*
health management information system *248*
Health Management Information Systems 115
Health Manpower 87
Health manpower development 68
Health Manpower in Rural Areas 89
Health Organization 963
Health Organizations 963
Health Plan 63
Health Planning 52
Defintion of 52
Health Planning Cycle 56
Health Policy 2002 520
Health Research 78
Health research 788
Health Scenario
of India 713
Health Sector 32
Health Sector Reform 32
Health sector reform 7
Health Service
Integration 144
Health Service System 82
Components of 82
Health Services in Delhi 97
Health Services, Public demand for 3
HEALTH STATISTICS 16
Health Statistics 701
Health Status 714
Health Status of India 25, 27
Health System 82
Health Service System
Components of 82
Health system 84
Health System Reform 95
Health System Research 37
Health Systems Development 105
Health systems research 69
Health Systems, Structure of 82
Health team 82
Health Tourism 719, 724
Health Trust of India 125
HEALTH VISION 2020 30
Health Vision 2020 India 30
Healthcare financing 75
Healthcare Providers 85
healthcare system 82
Healthy life expectancy 104
HelpAge 977
Hepatitis B *197*
Hepatitis B surface Antigen *228*
Hepatitis B Vaccine *197*
Herpes Simplex Virus 228
High Disease Burden 27
Hind Kusht Nivaran Sangh 447, 981
Hippocratic Oath 833
HIV 747
HIV Testing 47, 750
HIV/AIDS 12
Home Available Fluids *188*
Home based newborn care *179*
HOMEOPATHY 841
Homeopathy Central Council Act 841
Homoeopathy 27
Vertical Program
Horizontal Program 8
House Mapping 46
Household Listing 46
Housing 675
hukah 591
Human Genome Project 566
Human Immunodeficiency Virus *228*, 747
Human Influenza Type A H1N1 647
Human Papilloma Virus 228, 566
Human Resource Development 114
Human Rights 872
Hunger 11
Hypertension 581

I

ICDS 495
ICPD *158*, *159*
IDSP 471
Illness 1

Immoral Traffic (Prevention) Act *166*
Immoral Traffic Prevention Act 880
IMNCI *179, 181,* 183
see Integrated Management of Neonatal & Childhood 183
IMNCI-PLUS *183*
IMNCI-Plus 183
Impact Evaluation 704
Impairment 620
impairment 620
IMR 28
Statewise 28
Incinerators 940
Income
Statewise 28
Income, Per Capita Statewise 28
Incremental Cost 704
India Population Project 677
India Vision 2020 30
Indian Aircraft Act 855
Indian Association of Preventive and Social Medici 983
Indian Constitution 31
Indian Medical Council Act 834
Indian Medicine 840
Indian Medicine Central Council Act 840
Indian Nursing Council Act 837
Indian Pubic Health Association 982
Indian Public Health Standards 127
Indian Red Cross Society 980
Indian Red Cross Society Act 960
Indoor Air pollution 932
Indoor Residual Spray 397
Industrial policies 710
Industrialization 931
Inequity 3
Infant Milk Substitutes 892
Infant Milk Substitutes Feeding Bottles Act 893
Infant Mortality Rate 27, 73, *160, 176*
infanticide *234*
Influenza Type A 647
Injuries 28
Input-Out Analysis 705
Inputs 702
Insecticide 397
Insecticide Act 952
Insecticide Policy 396
Insecticide Spray Operations 399
Insecticide Treated Bed nets Program 400
Integrated Child Development Service 495
Integrated Child Development Service Scheme 495
see also Nutritional Programs 495
Integrated Disease Surveillance Project 471
Integrated Management of Childhood and Neonatal II *181*
Integrated Management of Neonatal and Childhood II 181
Integrated Program 8
Integrated Program For Older Persons 610
Intellectual Property Rights 758
Intensified Malaria Control Project 379
intergovernmental organizations 965
Interheart 563
International Conference of Population and Develop 158
International Conference on Population and Develop *158, 159*
International Health Regulations 961
International intergovernmental organizations 966
International Labor Organization 973
International Law 966
International Monetary Fund 7
International Non-Governmental Organizations 976
International Organizations 965
International Regime 966
International Union Against Cancer 976
International Union Against Tuberculosis and Lung 976
Intersectoral coordination *240*
Intradermal Rabies Vaccination 467
invention 847
Investment in Health 6
IPP-VIII 677
Iron deficiency Anemia *166,* 506
Irrigation 72
IUAT 976
Ivermectin 416

J

Jain Committee 54
Jan Arogya 901
Janani Shishu Suraksha Karyakram *173, 184*
Janani Suraksha Yojana 134
Janasankhya Sthiratha Kosh 743
Jangalwalla Committee 55
Janvac 421
Japan International Cooperation Agency 976
Japanese Encephalitis 419
see also Vector Borne Diseases 419
Jawaharlal Nehru National Urban Renewable Mission 153
JICA 976
Job Analysis 703
Job Description 106
Joint Commission International 108
JSSK *173*
Jungalwalla Committee 55
Juvenile Justice (Care and Protection) Act *166*
Juvenile Justice Act 893

K

Kala-Azar 411
Kala-azar 411
Kanamycin *279*
Kartar Singh Committee 55, 65
see Health Planning 55
Kerala 37
Kerala Model 37
Keratomalacia *192*
Kishori Shakti Yojana 497
Kolkata Declaration on Public Health 15
Kolkatta DECLARATION 15
Krishnan Committee 55, 87
Kusht Rog 443

L

Ladli Scheme 156
Lambdacyhalothrin 397, 399
Larvivorous Fish 385

Legal Blindness 518
Leishmania Donovani 413
Leishmaniasis, visceral 411
Leper 456
Lepra Reaction 448
Lepromatous Leprosy 446
LEPROSY 443
Leprosy 28, 443
see also National Leprosy Eradication Program 443
Leprosy vaccine 456
Leptospirosis 436
life skills *168*
Life Skills Education 548, 666
Lifestyle Disorders 562
Link volunteers *230*
Literacy 48, 799
Statewise 28
Literacy Rate 27
Logistics *246*
Lymphatic Filariasis 415
Lymphedema 416

M

Macro Economic 33
Macroplanning *209*
Magic remedy 861
Mahila Arogya Samiti 150, 153
Mahila Arogya Samitis 682
Mainstreaming Gender *234*
Malaria 12, 370
Dipstick Test in 374
Hardcore areas of 375
National Drug Policy for Malaria 387
Surveillance of 385
Malaria Action Program 375
Malaria, Active Case Finding 386
Malaria Complicated 373
MALARIA CONTROL 374
Malaria Epidemics 402
Malaria Epidemics, Preparedness 402
Malaria, Passive Case Detection 386
Malaria surveillance 385
Malaria Vaccine 409
Malathion 397
Malnutrition 487
Statewise 28
MAMTA Scheme 155
Manual Scavengers 911
Manual Scaverngers 911
MAPEDIR 23
Marginal Budgeting for Bottlenecks (MBB) *244*
Marginal Cost 705
Marginal farmer 817
Maternal and Perinatal Death Inquiry and Response 23
Maternal deaths
Causes of *172*
Maternal health 12
Maternal Mortality *160*, 874
maternal mortality *172*
Maternal Mortality Rate 27, 875
Maternal Mortality Ratio 875
Maternity Benefit Act 877
MCR Sandals 452
MDG, Challenges for 13
Measles 28, *195*
Measles Control *195*
Measles Control in india *195*
Medical Council of India 834
Medical Education 124
Medical Grants Commission 717
Medical Professional Oath 837
Medical Rehalitation 622
Medical Termination of Pregnancy Act 875
Medical Termination of Pregnancy, Safe *175*
Mediclaim 901
Mefloquine 391
Mega cities *229*
Meningitis 28
Mental Disorders 539, 540
Mental Health 70
Mental health 718
Mental Health Act 906
Mental Retardation 552, 540, 541
Methane 947
Micro Cellular Rubber 452
Micro economics 33
Micro Planning *209*
microfilaria 415
Micronutrient Malnutrition 512
MID-DAY MEAL PROGRAM 503
Mid-day Meal Program 503
Milestones of Family Welfare Program *158*
Millennium Deevlopment Goals 11, *161*
Mines Act 916
Minimum Needs Program 673
Minimum Wages Act 924
Ministry of Health
Organizational structure of 84
Ministry of Health 84
Misconducts 837
Mission Steering Group 111
Mitigation 958
Modified Plan of Operation 375
Monitoring 701
Mopping Up *208*
Morbidity indicators 24
Mortality Rates, Childhood *176*
Mother Baby Friendly Health Services *255*
Mother NGO *244*, 980
Mother-Friendly Childbirth Initiative *254*
Motor Vehicles Act 956
MTP Act 875
Mudaliar Committee 54
see Health Planning 54
Mukherjee Committee 54
Mukhya Sevika 499
Multi –Drug Therapy 450
Multi-lateral organizations 964
Multi-Purpose Worker 89
Multi-Purpose Worker Male 89
Multi-Purpose Worker, Male 89
Multibacillary Leprosy 448

Multiple Indicator Survey 19, 22
Multipurpose Worker Female 88
Mumbai Declaration 16

N

NABH 108
Narcotic and Psychotropic Drugs 857
Narcotic Drug and Psychotropic Substances *166*
National Mental Health Program 543
National Accreditation Board for Hospitals 108
National Accreditation Board for Hospitals & Healt 108
National AIDS control organisation 77
National AIDS Prevention Policy 747
National Anti-Malaria Program 378
National Blood Policy 754, 762
National Cancer Control Program 569, 591
National Cancer Registry Program 572
National Charter for Children 2003 771
National Council For Clinical Establishments 843
National Development Council 63
National Disaster Management Authority 958
National Disaster Response Fund 959
National Drug Policy for Malaria 387
National drug policy for malaria 2007 387
National drug policy for malaria 2008 387
National drug policy for malaria 2013 387
National Environment Policy 2004 805
National Environment Tribunal Act 945
National Family Health Survey 21, 44
National Food for Work Program 910
National Health Accounts 132
National Health Bill 825
National Health Mission 77, 116
National health mission 77
national health mission 111
National Health Planning 52
National Health Policy 2002 712
National Health research Policy 788
National Health Research System 790
National Health Service 84
National Housing and Habitat Policy 1998 814
National Immunization Days *206*
National Immunization Schedule *204*
National Income 33
National Institute of Social Defence 901
National Iodine Deficiency Disorders Control Progr 539
National Iron + Initiative *167*
National Leprosy Eradication Program 443, 447
National List of Essential Medicine 617
National Malaria Eradication Program 374
National NGOs 980
National Nutrition Mission 786
National Nutrition Policy 785
National Nutritional Anemia Prophylaxis Program 506
National Oral Health Program 599
National Organ Transplant Program 603
National Organizations 979
National Policies related to Health 709
National Policy for Education 798
National Policy for Older Persons 607, 779
National Policy for the Empowerment of Women 2001 765
National Policy on Older Persons 608
National Polio Surveillance Project *205*
National Population Policy 2000 737
National Program for Burn Injuries 626
National Program for Control and Treatment of Occu 480, 483
National Program for Control of Blindness 518
National Program for Prevention and Control of Dea 612
National Program For Prevention of Burn Injuries 626
National Program for Prophylaxis against Blindness 509
National Program For Rehabilitation of Persons Wit 623
National Program of Improved Chulha 698
National Public Health Board 830
National Registry for Burns 629
National Rehabilitation and Resettlement Policy 817
National Rural Employment Guarantee Act 909
National Rural Health Mission 70, 111, 117
National Sample Survey Organization 23
National Slum Policy *229*
National Technical Advisory Group on Immunization 759
National Trauma System In India 630
National Trust for Welfare of Disabled 905
National Urban Health Mission 151, 682
  Targets 151
National Vaccine Policy 754
National Vector Borne Disease Control 367
National Vector Borne Disease control Program 378
National Vector Borne Diseases Control Program 367, 382
National Water Policy 2002 801
National Youth Policy 776
Navjaat Shishu Suraksha Karyakram *173*, *184*
NCD 115
NCD Surveillance 562
Negligence 846
Neisseria gonorrhoeae 228
Neonatal Mortality Rate *175*
Neonatal Tetanus 28, *196*
Net Domestic Product 34
Net National Product 27
Netherlands Leprosy Relief 977
Newborn and Childcare *164*
Newborn corner *183*
Newborn Health 175
Newborn health 178
Newborn stablising unit *184*
NFHS 21, 44, 48
NFHS, Data Collection 46
NFHS, HIV Testing 47
NFHS, Sample Design 46
NFHS-4 49
NGO 964, 980
NGO, Mother 102
NGOs 244, 976
  Mother 244
  Small
    Mother 244
Night Blindness 509
Night blindness *192*
NIPAH 434
Nipah virus 434
Nitrogen oxides 946
NLEM 617

NLR 977
Noise Pollution 810, 933, 956
Non Communicable Diseases 115, 575
Non-communicable conditions 28
Non-Governmental Organizations 964, 976
Norad 975
Norms for safe water supply 675
Norwegian Agency for Development Co-operation 975
Nosocomial Infection 936
Notifiable Diseases
  in Factory Act 916
NRHM 117, 127, *159*, *160*
  Critical comments on 127
National Rural Health Mission 117
NRHM, District Level Household Survey 21
NSI 982
nuclear family 817
Nutrition Problem 785
Nutrition Society of India 982
Nutritional anemia *192*
Nutritional Deficiency 489
Nutritional Program for Adolescent Girls 497
Nutritional Programs 486
NVBDCP 367

O

OASIS 780
Obesity *166*, 563
  Measures of 563
obesity *166*
Obesity in Adolescents *166*
Obligations of Central Government 827
Obligations of State Governments 828
Obligations to respect, protect and fulfill 828
Occupational Disease Centers 921
Occupational Diseases 480
Occupational health 68
Old Age Social & Income Security 780
Old Poor Law 606
Oncology Wings 571
One world one health 652
op down Approach 56
Operation Blackboard 799
Ophthalmic Assistant 522
Opium 858
Opportunity Cost 705
Oral cavity 599
Oral diseases 599
ORAL HEALTH 599
Oral Health Education 600
Oral Rehydration Salt *186*
Oral Rehydration Salt Solution *185*
Organ Retrieval Banking Organization 604, 864
Organ Transplant 603
Organization 963, 964
Organization of Islamic Conference 965
Organizations, Bilateral 964, 974
Organizations, Governmental 979
Organizations, Multi-lateral 964
Organizations, National 979
Organizing National Filaria Day 418
Organophosphorus 398
ORS *186*, 187
  Composition of 187
ORS Program *186*
Oseltamivir 650
oseltamivir 650
overweight 48
Oxfam 979
Ozone 947
Ozone Depletion 813

P

P falciparum 370, 371
P vivax 370, 371
Panchayati Raj Institutions 769
Patents Act 847
Paucibacillary leprosy 448
PC & PNDT *174*
PEM 28
Pentavalent vaccine *200*
People's Charter For Health 15
Perinatal Mortality Rate *175*
Periodontal disease 600
persistent diarrhea *186*
Personal Protective Equipment 647
Persons with Disabilities Act 903
Pesticide risk 953
Pharmaceutical Policy 794, 796
Pharmacovigilence Program of India 618
Pharmacy Act 839
PHC 87
Phlebotomus Argentipes 413
Plague Regulation 854
Planning 56
  see Health Planning 56
Planning Commission 58, 63
Planning Commission of India 63
Planning Cycle 56
Planning in Modern India 52
Planning Machinery 58
Planning Machinery in India 58
  see Planning 58
Planning Process 56
Plantation Labor Act 926
Plasmodium cycle 372
Plastic Waste (Management And Handling) Rule 953
PNDT Act 886
Pneumoconiosis 481
Pneumonia 191
Policy 709
Polio Eradication *212*
Polio Eradication program *205*
Pollution 930, 950
Pollution Abatement 809
Poppy straw 858
Population 3
  Statewise 28
population 3
Population Explosion 738, 933
Population Growth 6
  Rapid 6

Population Stabilization *161*, 161–162
Population, Statewise 28
Post-exposure Treatment
for Rabies 465
Postneonatal Mortality Rate *176*
Postpartum care *174*
Postpartum IUCD insertion *174*
Poverty 3, 28, 679
Public Health Chanllanges for 3
Statewise 28
poverty 11
Poverty Alleviation Schemes 681
Poverty line 27
Pradhan Mantri Swasthya Suraksha Yojna 98
Prayas 982
Pre Service IMNCI *184*
Pre-Exposure Prophylaxis
against Rabies 465
for Rabies 465
Pre-Planning 56
Prelacteal Foods *189*
Prematurity *178*
Preventable blindness 518
Prevention and Control of Anemia *192*
Prevention of Food Adulteration Act 867
PRI 126
Primaquine 391
primary education 11
Primary food 869
Primary Health Care 6
Primary Health Centers 87, 121, 129, 674
Primary Urban Health Center 150, 154
Primordial Prevention 581
of Non-Communicable Diseases 581
private health care expenditure 105
Private Health Sector 96
Privatization 96
Procurement *246*
Professional Bodies 982
professionalism 833
Program 701
Prohibition of Sex Selection 886
Project Appraisal 701
Prostitution 874
Psychosocial Health 5
Psychosocial issues 5
Psychotic Disorders 540
Public Demands 3
for Public Health 3
Public Distribution System 675
Public Expenditure *239*
Public Health 2, 38
Achievement 1
Challenges 3
Challenges of 3
Epidemiological Transition in 5
Public health 1, 3, 69
Public health Achievement 1
Public Health Care System 85
Public Health Delivery 3, 4
Public Health Expenditure 97
Public Health Foundation of India 982
Public Health Infrastructure 716
Public Health Law 821
Public Health Management 114
Public Health Sector
Failure 95
Public Health Sector, Failure of 95
Public Health Service
Marginalizing 4
Public Health System 104
Public Liability Insurance Act 944
Public Private Partnerships 101, 123, *230*, 402, *243*
in RCH 231
Public sector failure 11
Public-Private Partnerships for Urban health *230*
Pulse Polio Immunization *206*
Pulse Polio Program *205*
Pyrethroids 398

Q

Quality Council of India 108, 110
Quality of Medical Education 833

R

Rabied Control Units 467
Rabies 464
Rabies Control Program 464
Rabies Immunoglobins 468
Radiation and Nuclear Pollutions 933
ramework Convention on Tobacco Control 580
Rapid Fever Survey 386
Rapid Population Growth 6
Rapid Test
of Malaria 374
Rashtriya Bal Swasthya Karyakram *180*
Rashtriya Janani Suraksha Yojana 746
Rashtriya Janani Suraksha Yojna 746
Rashtriya Swasthaya Bima Yojna 35, 98
Rational use of Drugs 616
Rational Use of Medicines 616
RCH
Behavior Change Communication in 241
Community participation in 243
Donor Convergence 240
Monitoring and Evaluation in 248
NGOs Role in 245
Procurement and Logistics in 246
Public Private Partnerships in 243
Public-Private Partnerships 230
RCH components *161*
RCH-II *161*
Re-Orientation of medical education 66
Reception Order 907
Refractive errors 520
Registration of Births and Deaths Act 19, 853
Rehabilitation 622
Rehabilitation Council of India Act 839
Rehabilitation of blind 622
Rehydration Therapy *187*
Remote Sensing 406

Renuka Roy Committee 54
Reorientation of Medical Education 144
Reproductive and Child Health *159*
Reproductive Health *160, 164*
Reproductive Right *160*
Reproductive Rights *160*
Research
  Health System Research 37
Reverse cold chain *202*
Revised National Tuberculosis Control Program
  see RNTCP 260
rheumatic heart disease 580
RHIME 20
Right to appropriate health care 828
Right to health 828
Right to Sight 525
Rights of Mentally Retarded Persons 552
Rights of the Girl Child 768
Risk Communication 2
Risk Factors 25
  Contributing to DALYs 31
Risk factors 23
Risk factors, causing DALYs loss 31
RMNCH + A Strategy *162*
RMNCH+A 115
RNMCH A Plus strategy *172*
RNTCP 260
Road-traffic accidents 630
Rogi Kalyan Samiti 104, 140
Role of doctors 832
ROME 66
Rotary International 978
Rotavirus *185*
RTI 228
Rudolf Virchow 832
Rules 822
Rural electrification 72
Rural Haats *171*
Rural housing 72
Rural Roads 72
Rural Telephony 72
Russia 84

S

SAARC 974
SABLA scheme *167*
Safe Medical Termination of Pregnancy 175
SAFE strategy 527
Safety Communication 2
Salmonella *185*
Sample Registration System 19
Sample Surveys 21
Sand fly control 413
Sanitary napkin Program *171*
Sanitation 28, 71
  Statewise 28
sanitation 12
Sanitation and Hygiene 122
SARS 646
Sati Act 879
Save the Children 979
Scheduled Caste 27
Scheduled Castes 910
Scheduled Tribe 27
Scheduled Tribes 910
Scheme for Adolescent Girls 497
Scheme Of Integrated Education For The Disabled CH 621
Schizophrenia 540, 541
School Eye Screening Program 522
School Health Programs 661
School Health Schemes in Delhi 667
School Health Services 661, 662
School Mental Health Program 665
SDE *247*
SDE analysis *247*
SECOND FIVE YEAR PLAN 64
Second hand smoking 594
Segmentation of health care system 8
Self Employed Women's Association 34
Self Help Groups 554
Sentinel surveillance 471
Sentinel surveillance: 471
Sero-surveillance 471
Service NGO 980
Service NGOs *245*
Seven Cleans *251*
Severe Acute Respiratory Syndrome 646
Sewer 950
Sex Ratio 27
Sex ratio 31
Sex Selection 886
Sexual Offences 874
Sexually Transmitted Diseases 750
Shigella *185*
Shrivastava Committee 55
  see Health Planning
    see Committee 55
sick Newborn Care Units *173*
Sickness 1
sickness 1
Sickness Benefit 918
Siddha Colleges 27
Siddha System 840
Siddha System of Medicine 840
Siddhu Committee 55
Simplified Information System 454
Sink Source" dynamics *213*
Skilled obstetric care *172*
Slide Positivity Rate 387
Small NGO 981
Small NGOs *244*
Smog 947
smokers
  at risk of disease 593
Smoking
  Health effects of 593
Social Blindness 518
Social Franchising *244*
social insurance 37
Social Interventions 37
Social Marketing *244*
Social pathology 5

Soil Pollution 810
Solid waste 932
Sophisticated and Analytical Instrument Facilities 756
Sources of data 16
Sources of financing 6
South Asian Association for Regional Cooperation 974
Special Newborn care Unit *184*
SPECIAL NUTRITION PROGRAM 489
Special Nutritional Program 489
Standards For Clinical Estabishmnets 843
State Health Society 610
State NGOs *245*, 980
Statistics 20
STDs 750
STEPS Wise Approach 562
Sterilization 48
Sterilization services *220*
STI 228
  Prevalence of 228
Stimulating Demand *239*
Stroke 580
structural adjustment 964
Structural reform 95
Sub-Center 88, 120
Sub-center 674
Sub-Centers 120
Subcenters 131
Substance Dependence 555
Substance Use 557
Sugar salt solution *187*
Sulabh International Social Service 981
Sulphur dioxide 946
Surveillance 385, 471
Survey 471
Sustainable Development Goals 13
Swarna Jayanti Shahari Rojgar Yojana 150
Swasthya Jan Sunwais 830
Swine Flu 647
SWOT Analysis 724
Syndromic Surveillance 473
Synthetic Pyrethoids 398
Syphilis 228

T

Tamil Nadu Integrated Nutrition Program 489
Tamil Nadu Model 91
Target Free Approach 144
target-oriented
  Family Planning *158*
Task Analysis 703
TBA 89
Teen pregnancy 48
Teenage Pregnancy *166*
Telemedicine 726
Tenth Five Year Plan 67
The Environment Improvement in Urban Slums scheme 681
Thioamides 451
THIRD FIVE YEAR PLAN 64
Tissue Culture Vaccine 466
Tobacco 591, 856
Tobacco Control Cell 595
Tobacco Free Initiatives 596
Top Down Approach
  see Bottom Up Approach 56
Top down Approach 56
Top down approach *159*
Top-down Approach 57
Total Fertility Rate 48, *160*
Total Literacy Campaigns 799
Total Sanitation Campaign 122
Trachoma 522
trachoma 522
Tracking Each Pregnancy 135
Trade Union Act 928
traditional birth attendant 89
Traffic 931
trained dai 89
Transplant of Human Organ Act 603, 863
Transplantation of Human Organ Act 863
trauma systems 630
Treponemes pallidum 440
treponemes pertenue 440
Triage 641
Tribal Health *214*, *231*, 233–234
Tribal Malaria 407
Tribals 114
Trichomonas vaginalis 228
Trick-or-Treat 970
Trigger 477
Burden of Diseases 5
Triple Burden 5
  Burden of Diseases 5
triple burden 471
Triple Burden of Diseases 5
Tuberculoid Leprosy 446
TUBERCULOSIS *260*
Tuberculosis
  Side effects of Antituberculosis Drugs 279
Twelveth Plan 72
Twenty Point Program 676
Type 1 Diabetes Mellitus 576
Type 2 Diabetes Mellitus 576
Typhoid *199*
TYPHOID VACCINE *199*, *200*

U

UDISHA 501
UICC 976
UK 84
Unani Colleges 27
Unani System 840
Unani System of Medicine 840
Under five mortality *176*
Under weight 48
Undernutrition *166*
Unethical Acts 837
UNHCR 973
UNICEF 968
Unicef 968
United Nations 966

United Nations Children's Fund 968
United Nations High Commissioner for Refugees 973
United States 83
Universal Health Coverage 115
Universal health coverage 74
Universal Immunization Program *192*, *193*, 754
Unmet need of emergency contraceptives *251*
unsafe food 871
Urban and Rural Health Differences 714
Urban Health 86, *228*, 718
Urban Health Center 149
Urban Health Insurance Model 683
Urban Health Posts 87
Urban Health Services 86
Urban Malaria Scheme 375
Urban Population 27
URBAN REVAMPING SCHEME 87
USAID India 974
User Fees 7
USHA 150, 152
Utilization rate 24

V

Vaccine
  Tissue Culture Vaccine 466
vaccine associated paralytic *213*
Vaccine Preventable Diseases *193*
vaccine preventable diseases 755
Vaccine quality regulatory system 757
Vaccine Research Development 755
Vaccine Vial Monitor *202*, *210*
Vaccine wastage 760
Vaccines carriers *202*
Vector Borne 367
Vector Borne Disease Control Program 367
Vector Borne Diseases 367
Vector borne diseases 367
Vector Control 396, 417
Vector Surveillance 427
Vectors of Malaria 372
VED *247*
VED analysis *247*
verbal autopsy 24
vertical and integrated program 8
Integrated Program 8
Vertical Program 8, 10
Vertical program 10
Vertical programs 10
VHAI 981
Vibrio cholerae *185*
Village Health & Sanitation Samiti 124
Village Health Guide 89
Village Health Surveys 23
Village health worker 142
Violence against Women 767
Vision
  in RCH-II *161*
VISION 2020 30
Vision 2020 69, 525
Vision 2020 for India 69
Visual Acuity 518
Visual Impairment 622
Vitamin A Deficiency 522
  Control of 522
Vitamin and Mineral Deficiency 511
Vitamin- A deficiency 192
VITAMIN-A DEFICIENCY 509
VOC 947
Vocational Rehabilitation 622
Volatile Organic Compounds 947
Voluntary Health Association of India 981
voucher scheme 136
VPD surveillance 760

W

Walk in coolers *201*
Waste
  Hazardous 943
  Municipal Solid 942
Water (Prevention and Control of Pollution) Act 950
Water and Sanitation 685, 931
Water, Clean water for all 71
Water Policy 801
Water Pollution 809
Water scarcity 801
Water Supply 675
Water-based diseases *185*
Water-related vector diseases *185*
Water-scarce diseases *185*
Water-stress 801
Waterborne diseases *184*
Weekly iron and folic acid supplementation *167*
Wheat Based Supplementary Nut-rition Program 489
Whipple's index 18
WHO 967
WHO Global Malaria Control Strategy 408
Whooping cough 28
WIFS *167*
Women Empowerment 31
Women's Conference 826
Worker's Compensation Act 922
World Bank 524, 971
WORLD FOOD PROGRAM 515
World Food Program 515
World Health Organization 524, 967
World Trade Organization 964, 971
WTO 971
Wuchereria bancrofti 415

X

Xerophthalmia *192*

Y

Yaws 440

Z

ZIKA Virus disease 657
Zinc with ORS *187*
Zoonotic Disease 419
  see also Japanese Encephalitis 419